# The Builder.

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## *The Metropolitan (Underground) Railway.*

WHEN the project of a railway passing in a tunnel along a line of London thoroughfare, and to serve London traffic, was first distinctly put forward, there were many who doubted of its accomplishment. As to the construction; though a course for the Metropolitan Railway had been found, which would intersect the sites of few houses, there would still be the sewers to fall foul of, or to escape, and that wondrous reticulation of pipes which the wisdom of London ratepayers suffers to exist for the benefit of the paving "interest," and the particular inconvenience of riders and drivers; whilst, assuming that breakage of these arteries and veins could be prevented, so that a small river like the Fleet, or the whole contents of a waterworks' reservoir, would not be rushing from time to time through open cutting or unfinished tunnel, the difficulty was to tell what could be done under the apparently numerous probabilities of sewers, mains, and pipes, intersecting the line at the very level of rails or arch-springing, also to see on what available areas of ground stations could be placed, and how the passage of frequent trains, if safe, could be rendered free of nuisance in a length of subterranean way devoid of the open shafts which may have been sometime deemed necessary to ventilation in tunnels. Though sufficient reason has, we think, existed for the postponement of the certificate of the Government inspector, the bulk of the difficulties had some months ago been overcome, and in a manner which should command admiration especially of the class of readers we address; and the last of the essentials to efficient working of the line, the system and mechanism of signals, originally devised with appreciation of the importance of that branch of the arrangements, has at length, we are assured, been brought to the state of perfection which will allow the line to be used for traffic on this present Saturday. Some of the features of design and construction which the work comprises, will be noticeable at the stations; but many of the chief items of contrivance and skill are no longer obvious; and they have not been described in print. Our readers, therefore, may feel interested in results of an attempt which we shall make, to afford a more clear apprehension of the structural details of the great undertaking than has been given by some of our daily contemporaries; whose favourite phraseology in their now frequent notices of public works, that such or such a feature is "of immense strength," does not supply much information on the matter taken in hand,—even viewing the limited digestive power, as regarded, of "the general reader."

We have, in our last volume, and previously, not only stated what was the course of the line, but have given engraved illustrations of one portion of the work, at King's-cross, which has novel features, and involved certain difficulties of construction; and we have also printed some particulars of the accident of the bursting of the Fleet Sewer, at a point just north of the present City terminus, into the open-cutting which there, as in some other parts of the line, is substituted for tunnel. This accident, we may say, the company's engineers maintain was not caused by their works, but by faulty design and very bad construction of the sewer itself; the first portion of the accident, which involved but about 20 feet of the sewer, being, through inattention, left conducive to the second and serious calamity, which involved a length of about 100 feet; when the ground at the back of the company's retaining wall, became saturated with water, which at length undermined the foundations, so that the wall fell,—when it came down in a mass, showing the excellence of the workmanship. The inundation of the company's works in this case, where the sewer runs parallel with the railway, might have been merely one of several serious accidents from sewers and water-mains, had not the constant skill and watchfulness of the engineering staff,—and we must add, of the contractors,—been directed and alive to the prevention of them. The Fleet Sewer had to be carried across the main line, as we shall mention hereafter, and three times across branch lines, at a level below that of the crown of the arch of the tunnel, where it occurs, and in a manner to prevent the slightest leakage: the 3-feet service-main of the Grand Junction Water Company had to be held slung in chains for weeks, across an open cutting, when serious disaster might have accrued ere a messenger could have reached the sluice-keeper at the reservoir; and numerous smaller sewers and pipes had to be diverted, or to be taken across the tunnel, each with its different contrivance suited to the level and angle of crossing. For many of the water-pipes so intersecting, a special casting as supporting trough, was required to be built in with the brickwork as a portion of the crown of the arch; the pipe being so arranged in its receptacle, that the first effects of leakage would be retarded, and that the circumference of the pipe could be got at for necessary repairs from the street-level. In these several cases of intersection, usually the angles of crossing were different; and no casting could be ordered, or drawing even made, till the ground had been opened and dimensions taken: thus, delay in portions of the work was of frequent occurrence. Indeed, in numerous instances, positions of water-pipes were found to be different to those given by any plans to which the engineers had access when their own drawings were made. The flanged-joint pipes, not allowing much settlement, required more care than the socket-joint. Meanwhile, or rather from the commencement, the footways and the entrance-ways to houses had to be maintained; and the placing the supports for these was alone a work of considerable ingenuity. The company were bound to reinstate some things for which the opportunity might well have been taken to effect improvements; and the perils of injunctions of the Court of Chancery were freely thrown in the face of the undertaking. A passage-way under the road, from the garden of Park-crescent to that of Park-square, was to be retained in its level as found,—so that it became the datum for the depth of the railway below the road; whilst, some distance westward, at Stafford-street, one of the sewers of Marylebone was some feet above the level of rails. In this latter case, the authorities at first would accept neither of the courses offered,—the diversion by the side of the railway, or the passage below the line in inverted syphon form,—so that, after the gradients for the whole line had been decided upon, everything seemed to be thrown back for a fresh design under conditions of level which would have made the line very different from what it is. The two houses forming the horn of Park-crescent, north-east, which the line passes under, the company were required to purchase, to take down, and to rebuild exactly as they were, to the smallest detail. To accomplish this latter portion of the work required drawings, and the gutting of the buildings in order to make them. The drawings cost the company 150*l*. They possess some value for inquirers into the growth of modern practice of building. The company were advised that they could not hope to let their houses, unless there were basements of 8 feet in the clear height; therefore those dimensions had to be kept, and the houses carried by such an arrangement of girder-construction as would leave sufficient headway in the tunnel, and shut out as much as possible, noise of the passage of trains.

These instances will be sufficient to show the sort of skill that is required to construct a line underground, traversing any portion of area of a town; and it will be observed that the difficulties are different to, and greater than, those of formation of ordinary tunnels, such as the tunnels under the town of Liverpool, where a considerable thickness of earth or rock separates the crown of the excavation or arch from the foundations of buildings. In such cases, the practice of modern railway-construction has eliminated difficulties. It is easier to excavate a tunnel passing at a considerable depth below a surface,—unless the Mont Cenis case, where there are no shafts, be an exception, because of the new conditions which are involved with those of the very extraordinary length and vertical depth,—and easier in the case of cutting in open country, to deal with extraordinary stratification, than it is to construct a work which, like the greater portion of the Metropolitan Railway, has to be built and vaulted in a cutting through a town; or tunnelled in bad ground, so little below the street traffic as to be in constant vibration.

Should the working of the traffic of the Metropolitan Railway prove as successful as the engineering construction appears to be, the example may be followed in many towns, despite all the apprehensions that have prevailed in the present case from the delay in opening the line. A similar line is talked of for Paris; where the difficulties from water-charged subsoil must equal, or more probably exceed, any that have been met with in the London instance. This much however seems demonstrated as to railways below the street-level; namely, that along lines of street or *boulevard* such as London needs, and must one day possess,—lines direct and of great breadth, and having the sewerage and water-service provided for in sub-ways,—railways might be formed, if not altogether underground, contrived with some of the features of lighting and ventilation which were those of the scheme which preceded this of the Metropolitan Railway, we mean the project of the late Mr. Charles Pearson, to whose memory our recognition of his usefulness is due. At least we may say, that viaducts above the street level are for many reasons to be regretted. They interrupt the view,—as will be found shortly, though in a case where we may be told it could not have been avoided, in the crossing of Ludgate-hill; and the girder bridges of their engineers are vile blots on a city: these viaducts are objectionable as interfering with the circulation of air which is necessary in towns, especially in such districts as those traversed by the viaducts of the Great Eastern, North London, and Blackwall, and the South London lines; and their arches, which indeed might be turned to account (as long since suggested), made into comfortable dwelling-places for families who have inferior accommodation, or have been ejected from houses taken down for these very lines, seem to bring in little or nothing to shareholders, whilst they are to some extent resorts of the dangerous classes, and receptacles for dirt and filth. We do not press these points very strongly as in favour of the alternative of railways subterranean or below street-level; but we say that they deserve to have their due value considered now that opportunity has accrued for testing, in its working, the Metropolitan Railway, a line however which perhaps would

be inferior to such railways as a proper scheme of London street improvement would admit of.

Of course, if a line in any part of its length were liable to inundation, the objections preferred to the principle of the Metropolitan Railway would hold good; and there may be cities in which it would be impolitic to introduce the system. But with a tolerable level in the line of street, and no worse arrangement of the sewer levels than exists in London north of the Thames, if not south, and with such provisions for keeping a tunnel dry as exist in this Metropolitan Railway, the objections to the system have not all the force that has been attached to them. There is this further, to be said on the question between viaducts and underground lines, that given the most favourable circumstances for each, there is a difference between the two, of about 11 feet of staircase, in favour of the latter system. About 4 feet more of headway are required in arches over roads, for laden carts, than are required in the arches which a railway train has to pass under; and the height of the platform has to be *added* in the case of the viaduct, whilst it *reduces* the number of steps in that of the line below street-level.

It may be obvious that the rejection of the street-level itself, in favour of a level above or below it, for the railway, is due to the employment of the locomotive engine and the high rate of travelling. Were not the speed a requisite, the horse-tramway, advantages of which have heretofore been perceived by us,—and should be still advocated, spite of the mistakes that have unaccountably attended its introduction,—or some form of traction engine,—might be sufficient. There are indeed some cases where locomotive engines and trains pass on rails that are laid in streets, level with the carriage-way. An instance in Genoa was referred to when the tramway system was under discussion. But the manner in which similar railways along the line of the Liverpool Docks, and and at Holyhead, are worked, shows that they have no concern with the question of passenger traffic at a rapid rate, as the case is of London.

Hence we discover that in the contrivance of a tunnel line such as the Metropolitan, we are instantly confronted by the question of two alternatives, the one the quick extraction of the steam which would be given off from half-a-dozen chimneys of locomotives that always would be on the route, and the other the prevention of escape from the description of engine that we employ. Without the settlement, primarily, of the point, whether there were means of avoiding the nuisance we have referred to, it would have been scarcely wise to enter upon the construction of such a line as that which from King's-cross to Chapel-street, Marylebone-road, near the Yorkshire Stingo, has no shafts, and no means of ventilation (except at the ends) larger than might be required for the breathing powers of a number of persons such as the number of passengers in the trains. The object has been attained by the construction of a locomotive that is provided with the means of condensing the steam, and damping the fire. In the common form of engine, the steam that has done its work in moving the piston-rods which move the wheels, escapes into the chimney, where it assists the draft; whilst the meeting wind is a constant blower to the open fire. The locomotive for the Metropolitan Railway has a valve in the chimney, to be worked by the driver from his station in the rear of the engine, so that the steam can be instantly shut off from its escape. It passes, instead, into cold water of a tank that is carried under the boiler; and there, provided the water be changed often enough, or does not get too hot, it is condensed, as it is in the common stationary condensing engine. The under-"blowing" of the fire is intercepted by letting fall a flap to the latter. The two valves or flaps are, in the tunnel portion of the line, shut; but in the open cuttings, the ordinary steam-jet draught and air-blowing of the fire, and the non-condensation or escape of the steam, are, exactly as in ordinary engines on other railways, allowed to go on, for the better accomplishment of the distance in tunnel, with the husbanded force or pressure of the steam made whilst the locomotive was at the terminus, or travelling with space overhead. Coke is burnt, so that there is no smoke. At an inspection by Colonel Yolland, on the 27th of last month, so much time was necessarily spent at the stations, that the trial could hardly be regarded as a fair one for the engine. The locomotive, driven by Mr. Gooch, jun., however, behaved admirably; and there appears no reason to doubt that all that the public will demand will be fully accomplished. Should it be necessary to let off steam at any of the stations, as King's-cross, unusually large openings in the roof are found there; and the same means of taking in water as on other railways, are provided at places between the *termini*. As, however, it is necessary to calculate against any contingency, means of escape from the tunnel itself, for steam that may have accumulated, may be perfected, should such agency be found necessary. These means consist of certain small circular openings in the crown of the vault, in that portion of the line where the levels would conduce to an accumulation of steam, which openings form the terminations of pipes extending laterally to a junction with a larger and longitudinal pipe in the pocket or spandril of the arch, to which large channel some permanent contrivance for exhaustion can be attached. Ordinary ventilation required in tunnels, as they are on other lines of railway, will go on without shafts: there is always a current; and certainly we have experienced no inconvenience in walking through the tunnels on the Metropolitan Railway, or in passing through them on an experimental train. The question will hardly be asked, why engines of the sort described have not been in use on ordinary railways. The nuisance there, which is increasing, is from coal-smoke, rather than steam, which indeed in the landscape is rather pleasing; whilst it may be possible to carry the supply of water for condensation four miles, and not to carry a larger quantity, or to arrest the train at short distances frequently.

The reader having appreciated difficulties of the case of an underground railway, may now feel interested in an account of the chief features of the new metropolitan line (only some of which have been slightly referred to), and including those of the stations. To make the whole intelligible, we must repeat, and supplement, some general particulars. The line now extends, from a junction with the Great Western Railway, at the Bishop's-road Bridge (where there is a station), south of the Paddington Basin to Praed-street; the eastern portion of which last it passes along; it then crosses the Edgeware-road and passes parallel with the north side of Chapel-street (in which there is a station), to near the junction of Stafford-street with the Marylebone-road opposite the Yorkshire Stingo: thence it continues along the Marylebone-road (with a station at Baker-street) to Park-crescent, where it leaves the street-line to pass under the houses we have spoken of, and appropriate the patch of ground at the end of the Portland-road for a station: it then regains the New-road, and leaving a station at Gower-street, passes through Euston-square to King's-cross, where on the space between Gray's-inn-road and Battle-bridge, is the largest station, and whereabouts are the several branches, single lines, to the arrival and departure sides of the Great Northern Railway. One connexion, which is intersected by a branch of the Fleet, has been lately commenced; and it will diminish the chances of accident; as trains passing along it will avoid the awkward crossing near the pointsman's station. This station, a small spandril space of plan left between the main line and two branches, and domed over from the walls of the three tunnels, was illustrated by us as above said. It does not appear to be ready for use, indeed the rails in the branches were not all completely laid at the time of our last inspection. The branch which passes under Maiden-lane, joins the Great Northern line at some distance beyond the northern end of its passenger station. From King's-cross, south-easterly, open cutting with retaining walls commences: it is crossed by many bridges; and the line passes south-west of Bagnigge-wells-road, is crossed by that road and Wharton-street, and continues between the road and Granville-square, whereabouts there is a short tunnel. After a further portion of open cutting, it passes Coldbath-fields prison by a tunnel (which was driven) to open cutting by the Clerkenwell Sessions House, and to the station in Victoria-street. There is no portion of the line west of King's-cross that is open, except a large area of ground (where the engines may be stalled in recesses which have been built for them) between the second station we mentioned and the Yorkshire Stingo, and a short space close to the station at the Great Western Railway Junction. There is no branch to the London and North-Western Company's line. That company, it may be supposed, are content with their access to the City *viâ* the North London line, and direct to the station which they will have near Moorgate-street. The stations of the Metropolitan Railway, seven in number, are named Bishop's-road, Paddington; Edgeware-road; Baker-street; Portland-road and Regent's Park; Gower-street, for Tottenham-court-road and Euston-square; King's-cross; and Farringdon-street stations. The last-named of these is temporary. The line will eventually be continued, crossing Snow-hill and Skinner-street, to a junction with the London, Chatham, and Dover Railway, at its station on the site of the Fleet Prison; whilst a branch, for which the Act has been obtained, is intended to pass between Charterhouse-square and Long-lane, and to cross Barbican, Red Cross-street, White Cross-street, and Milton-street, ending at the Pavement, Finsbury-circus. Mr. Bunning has designed the New Market to occupy a site which would be intersected by the present course of Smithfield Bars; and it is intended that the railway should pass under the market. There are Bills in Parliament for western branches, or extensions, of the Metropolitan Railway, one of them to start in Praed-street, and pass the front of the Great Western Hotel, and to skirt the Serpentine, and end at Hyde Park-corner; and another to start from this latter branch and follow the western portion of Rotten-row to Kensington, ending in Young-street.

In the completed portion of this comprehensive scheme, the general dimension of breadth in the clear of the tunnel, or span of the arch, is 28 feet 6 inches, the brickwork being 2 feet 5 inches thick, or six rims, and backed by concrete to the walls; and the height from the level of rails to crown of the arch, is 16 feet 6 inches. The rails are laid to the "mixed," or broad and narrow gauge; and we believe, the statement that the tunnel had been formed too narrow, is correct only so far as the lengths between the stations are concerned, where a train should never have to stop, but where the corner of an opened door might touch the vaulting. Plenty of ingenuity has been applied in shaving close; and much originality with calculating power, has been exerted to combine moderation of expenditure with a response to the requirements, and perfect strength under the extraordinary conditions of railway engineering and railway-station architecture. The line will be worked by the Great Western Company.

The gradient is 1 in 100 each way from the lowest point, that where the line enters the City. The course of the line is chiefly in curves; the sharpest of these being one with a radius of 200 yards. In the driven portions of tunnel the crown of the arch reaches in the clear height, 18 feet 9 inches. In the open cutting, until the line widens out to the so-called Farringdon-street Station, the opposite piers of the retaining walls are counterforted across the line, by iron strutting similar to that to be seen on a similar portion of the line of the London and North-Western Railway in Camden Town. The bays between the piers are battered, and are segmental on plan to resist pressure of the earth; and within some of the stations a thin face-wall is added, leaving a cavity; so as to reduce as much as possible any influx of damp.

Every portion of the length of tunnel has of course a drain, which runs underground in the centre between the two lines of rails; and every area and pocket, and each basin or funnel-formed collector of land and surface water at the back of walls or on asphalte covering of the brickwork of the tunnel arch, has its down-pipe and connexion carefully provided. As the work approached Victoria-street, the ground was very wet; and the Coldbath-fields tunnel is still at various places undergoing the processes of pointing with cement, and cutting through the brickwork for the insertion of the catchwater-basins and down-pipes, which together may force and conduct the flow to the general drain-level of the tunnel. Damp and wet, indeed, are to be found, even in stations carefully planned and constructed, but underground; these appearances, however, are not such as to affect the use or substantiality of the work, and are expected to cease in part; and experience on other undertakings has tended to show that after an appearance of moisture from land-drainage leaves brickwork, the work there becomes harder than elsewhere. The strata may have something to do with that.

In one portion of the line between King's-cross and Clerkenwell, where the Fleet sewer had to be carried by girders in an iron water-tight duct of large dimensions, across a tunnel and below the crown of its arch, a short portion of a second and parallel line of tunnel for an expected future widening of the railway has been built, and the Fleet carried over or through both. The whole forms an admirable piece of work. The thin partition wall from which the two vaults spring, has iron castings built in, to get the requisite strength.

South of the King's-cross station, there are some remarkable skew bridges,—in particular, one for a wide street intersected by a narrower one, which gives a curious appearance to the bridge. The

smaller vault seems to groin into the larger one; though the case is not so.

Close by the Clerkenwell Sessions House, there is a steep bank of clay held up temporarily by a double row of piling at the foot. Hereabout, and for the station, concrete walling, or facing to the bank of earth, has been used where we should hardly care to trust to it.

The stations are less remarkable externally, and in architectural details, than they are for their disposition of plan, and for the clever construction of some of them, as the Baker-street and Gower-street stations, which nearly resemble one another. The Paddington, Edgeware-road, and King's-cross stations, have each an iron-framed roof, spanning the lines, and the arrival and departure platforms; whilst the booking-offices, spanning the line at a higher level, are carried on lattice girders, and are constructed of wood wherever light weight was desirable. These stations are perfectly lighted; in fact the King's-cross station seems in all points the best in London. Safety in crossing the line has been well studied, each of these stations having a bridge, or more than one, for the crossing. The Paddington Station has the front of its booking-offices in Bishop's-road. The architectural details and wall-facing of all the stations except the Edgeware-road Station (where the material is Ransome's stone), are in cement. The result is not more satisfactory than it usually is, where imitation of stone-worked mouldings and ornaments is attempted,—as indeed perhaps it ought never to be. The least pretentious of the buildings are the best; the King's-cross roof, effective enough within, is only a deformity in the street; and we must confess the extreme difficulty of the problem to make it otherwise. The roof of the Paddington Station is of lighter members than the roofs of the Edgeware-road, and King's-cross stations, where the principals are of wrought and riveted iron crossing the span in the form of an arch, and carrying light trussed girders as purlins, each of which is bridged by two rafters or secondary principals. These last-named members seem each to rest against the side of the top purlin, instead of butting against an opposite rafter or having the strain resisted from the opposite half of the roof. So the construction seems, looking at it from below, however it be as to real strength. There are two different arch-formed roofs to the King's-cross Station, separated by the bridged booking-offices, and one of wider span than the other; for, here, one of the branches of the Great Northern Railway curves in, and there is an intermediate platform with its separate staircase. Space is found at King's-cross, for a water-tank, holding 25,000 gallons. The roof-covering is formed in alternate breadths of glass skylight and zinc, which are stepped at each purlin to leave a large opening for ventilation, without louvres, which last offer much obstruction. In place of louvres, each division of the covering has considerable projection as eaves. Where the lights do not occur, the soffit of the roof is boarded. Ends of roof, the spaces which we may call *tympana* or gables, are left open: though very small, it is found that they give escape to a large quantity of steam compared with even non-louvred openings at sides of a roof. A small portion of the line onward is covered with a ridge and valley roof, extending the station. The southern halves of each span are covered, not with glass. Near this end of the station is a bold piece of construction, comprised of a skew girder-bridge, over the main line, and a brickwork arch, nearly semicircular, over the starting portion of the Great Northern branch. It is also askew. The pier which carries half the weight of the arch and thrust, and half the weight of the massive girder-bridge, is but 1 foot 8 inches on the narrowest face; though it becomes wider where the chief pressure is, and is of ample width on the further face. Passing back again through the King's-cross station, we notice before coming to the tunnel mouth of the main line, a skew-arch which is the mouth of the tunnel of the branch line. Its face of opening, or span of arch on the skew, is about double the transverse span of the general vaulting of this branch line. As brickwork, this specimen is very consoling to those who have thought the art extinct: but similar praise might be given to much of the work on the same line of railway. The pointsman's station, with the starting of the other branches, is reached at a short distance in the main-line tunnel.

The Edgeware-road station much resembles the King's-cross in the form and framing of its roof; though it is much smaller. We need not describe it, therefore; nor need we say more of the Paddington Station than that the roofed area of the rails and platforms (62 feet 3¾ inches span) is well lighted, and that the trusses take the form of a segmental or elliptical arch, with tie, and a filling-in of diagonal bracing, the covering being arranged in ridges and valleys,—six side spans, and one wider one in the centre, dividing the width spanned by the principal. The underground portion of the line from near this station, for some distance in the direction of Praed-street, has very little vertical space to deal with: the construction is therefore that of cross-girders and arches from them, instead of that which prevails further on.

At each of the three underground stations between King's-cross and Chapel-street, the tunnel has a larger span of arch, to afford room for the platforms, and has as much increased height as could be got, having regard to the fixed level of the street-pavement, and to the requisite strength of brick rims or rings; and other methods of lighting than those we have described, have had to be extemporized; and this has been managed with much skill. At the Portland-road station, which is the best of the whole number for external effect, light was got by the formation of a large eye in one portion of the crown of the vault; where ground above, had become the Company's property. This opening is glazed. Other lights are obtained from the two domes, and windows in their *tambours*, which are the chief features in the external view; and these domes have been so contrived with ventilating apertures, that an engine might stop under them and let off steam. The line is here on a curve. One platform is 217 feet in length; and the other 209 feet.

The most ingenious and clever construction on the whole line, however, is probably that seen at the Baker-street and Gower-street stations, which so nearly resemble one another that one description would serve for both. There is little change in the appearance of things above-ground from what was that of the New-road. In each case there is a small one-storied structure on each side of the road, which contains a booking-office and the heads of the separate stairs of descent and ascent to and from its side of the line. The light to the stations is got by taking space from the gardens of the houses, and constructing the vault of the station with a line of openings to the space. These apertures, or eyes, are lined with white tiles, as are also the sides of the areas; whilst the areas are roofed with thick glass carried on light iron gratings, — small apertures however being left for ventilation,—the upper surface of the glass being flush with the street-footway level; and the space being enclosed by a dwarf railing. This space is taken out of the gardens, in the Gower-street case; at the Baker-street station, the garden-gates and railings are set back, and the areas form an addition to the street, railed in however from the footways. The areas and the apertures in the tunnel vault can be got at for cleaning, and every portion is provided with drainage. The results of this arrangement for lighting are excellent. The contrivance however entailed that there should be special construction of the vault, that is to say the necessary strength in the haunches where the thrust was now to be carried from piers rather than a continuous support and abutment. The thickness is so distributed as to leave recesses of 6 feet 3 inches and piers of 3 feet 6 inches on the face; and the opening of each light is 4 feet 9 inches by a considerably greater dimension of height, especially if it be measured following the *intrados* of the vault. Sufficient abutment, beyond the backing of concrete, exists in the thickness itself, and the nearly equilibrated form of the arch. Where the rooms below the booking-offices, and the staircases, occur, the partition walls of these are the abutments; whilst, as the face of the pier is of slight width, a casting is built into the latter; and the soffit of each arch is carried and formed by a further arrangement of casting: thus these separate piers, with the arches, are all connected together. In one case where a room occurs, so that the pier could not extend back as abutment, two cast-iron struts diverging from the point of thrust to be relieved, are diagonally placed on plan and connected by a tie at the feet (or showing on the plan the form of a triangle); whereby thrust is distributed. To get the necessary strength in the work of the vault itself, and to keep the crown of the arch light, and the number of half-brick rims not so numerous or so arranged as to fill up the depth intended to be left between crown of arch and surface of roadway, or to make it necessary to drop the level of rails,—a peculiar construction of the vault was adopted, increasing the number of rims from the centre to the springing, yet preserving the bond and resistant thrust of the abutment, which latter force would have been cut at every stepping or set-off of sommering rims; and the additions would have added only weight and no strength. Therefore, after the crown or middle of the vault constructed in the ordinary manner, with the bricks sommering (in our description we reverse the order of the bricklaying), the whole of the rims, with as many sets-off as were necessary on the extrados, were laid with the bricks not sommering, but with the mortar beds or joints parallel, and therefore not parts of *radii* of the circle or ellipse. Thus, the rims, added as sets-off, could be bonded to the others, and did their work. Those bricks forming the soffit, which would have presented angles, were cut where required for appearance. At the springing, the thrust was received on a skew back, cut or formed on one bed, to the proper direction of a radius, and on the other to the last of the parallel lines of the bricks. Though the wedge-formation of voussoirs, supposed to involve the property of the arch, might seem to be given up by this described method of construction, the line of thrust always falls within the limits of extrados and intrados, whilst greater strength in other respects from better bond is obtained.

The present City terminus is a temporary building covered with a wooden roof in two spans, and of slight scantlings, which, however, having been arrived at, like every other detail of the railway, by calculation, are fairly considered to be quite strong enough.

One of the great features of this railway, which we might have noted above, is the small cost of the construction. It is affirmed that the whole cost of the Metropolitan Railway will come to less than 1,300,000*l.*; whilst a viaduct line intersecting building-property would have cost four times as much. The length of the line as at present, and deducting the branches, is three miles and three-quarters. The branches added together, would make half a mile. The chief engineer, as our readers know, is Mr. John Fowler; and the resident engineer is Mr. T. Marr Johnson, to whose fertility in resources we may rightly ascribe much of what may already be presumed to be the favourable result. Messrs. Knight & Smith have executed the western portion of the work, ending at Euston-square; and Mr. John Jay has finished the line to Victoria-street. As to the safety of the line, though it is said there may shortly be ninety trains a day, and at least three each way may be always on the move, there can be no danger if the prescribed system of signals continue workable. The mechanism of levers and lights, which is combined with the electric telegraph, had till the other day moved stiffly. Now that the signals have been certified as thoroughly complete, the company might do well to assure and satisfy the public that their staff will never be worked to the point of fatigue and carelessness which brings accident. One of the points to be attended to is that of the better lighting of the carriages. The gas-lights when last we were able to judge of them, were no better than the ordinary, bad, oil lamps.

Believing that this new route may do something towards providing many classes of Londoners with better dwellings, and realizing other objects in which we have taken interest, we hope that the undertaking may have every kind of success. But six o'clock, the hour arranged for the first train in the morning, will not be early enough for working-men; and it may be questioned whether 5d. for the third class return-ticket will not be too much.

## AFTER-THOUGHTS ABOUT THE INTERNATIONAL EXHIBITION.

THE further the present advances from the past the fainter will be our remembrance of the Great International Exhibition, the more vague the mind pictures upon which we shall shut our eyes and gaze. Here and there, all over the world, in glass cases, in cabinets, in galleries, on drawing-room tables, in gard-robes, in museums, in country houses, in town mansions, in palaces and churches, we shall, from time to time, come in contact with objects that were once part of the prismatic whole; but, nevertheless, as our lives trample down the days, it will be more and more difficult to bring to mind the brilliant, many-coloured, many-toned, eye-filling impressions we thought we had garnered up. There were so many adjuncts that are likely to slip from our remembrance. Let us consider the noises. There were the deafening roar of the foaming flood set in motion by the centrifugal steam force-pump, near which the human voice was inaudible; there was

the splashing, dripping, rippling of water from the majolica fountain; the tones of the great organ filling the air with ecstacy; the whirr, the twirl, the thud, the hiss of machinery in motion; the blows of the steam-hammer; the tumultuous reverberations, the clang and clash of the immense bells, the chimes of the great clock; there were the brass bands, the performances on the sax-horns, on countless pianos; the rustle of silk, the buzz of voices, the shuffle of feet; certain sounds breaking into prominence as we neared them, and subsiding as we receded from them; perhaps a word or two from one voice, all blended in one muffled, intense hum. How long shall we command a realization of this? The word may outlive the roar.

Let us recall the polyglot literature. In twenty years' time shall we ever think of the pamphlets, prospectuses, cards, in every colour of the rainbow, placed in little piles, and in lidless boxes within reach of the public, as a means of advertisement? And yet the handbills and cards offered to visitors, formed a feature of the fair, that was of curious interest. The English language looked so like a foreign tongue when printed with French type; and the French so like our own, when rendered in fair round English characters, that the effect was momentarily confusing. The translations of foreign advertisements teemed with so many mistakes, introduced such comical English; and the rendering of English into good French or Italian, appeared to be beset with as many difficulties, and to produce as droll results. Austrian-English is not less wonderful. What could be the exact meaning of George Hartl & Son, of Vienna, when they distributed a notice that they manufactured "Utmost-purified-cocos-nut-oil-soda-soap (inodorous) white and red, in four angle-tiles, hollow pressed in satin etiquettes in carts?" What are satin etiquettes, and how do they come to be in carts in Vienna? Then, again, what eccentricity was meant by "two sleeping childs," manufactured in soap, and an "Amour with arrow?" MM. Topart, Brothers, Paris, attested that they could make "imitation *real* pearls and corale." M. Descole, Paris, and M. Galopin, Paris, had both been vanquished by the intricacies of number, and announced, respectively, that they are lamps manufacturers, and possess lamps warehouses. And why did M. Boissoneau, *ocularist* of the French army, in a handbill, which we have not yet laid aside, illustrated by the head of a gentleman with a bandage over his right eye, and the head of a lady, with a bandage over her left eye, disturb our fixed ideas on transubstantiation, by declaring that he would be himself on the 1st and 2nd days of the months of June, August, and November, leaving us to understand, darkly, that in the intervals he would be somebody else? A reference to a collection of these ephemeral productions shows us curious facts bearing upon the growth of language. A Baltic *savan*, S. Hestermann, Altona, advertising his "telluriums," writes with a wording of our tongue that the Danes would have found current here a thousand years ago. The story he tells is an old, old tale—oft told—his are the real telluriums, the best embossed globes, all others are spurious. "In the interest of the public I warn against those telluriums turned by means of strings and chains; they give way very soon, and the mechanism stops for ever. I speak from my own and other experiences dearly bought." His embossed earth globe "very practicable and price-worthy," may be bought in various sizes for sums varying from 1*l.* 5s. to 50*l.*, "paid in cash." Mr. Hestermann would not like to be paid, we may infer, in Topart's imitation real pearl beads. How confiding is Joseph Piney, machine builder, at Abilly. Let us read what he calls his "note on his exhibition and workshops." He writes in the third person. "Between 1855 and the present day M. Pinet delivered 4,500 horse-gears, 4,500 thrashing-machines, 500 winnowing machines, a great number of hydraulic motors, transmissions, &c. The yearly amount of affairs is of 32,000*l.* The number of workmen is about 300." The number of gold, silver, and bronze medals M. Pinet has obtained he tells us is ninety; and besides this almost incommoding accumulation of distinctions, he received the cross of the Legion of Honour as agricultural implement manufacturer in 1860. What more can we want to know about M. Pinet? Here is a specimen of long-worded Austrian-English. It is a large blue prospectus about F. J. Kwizda's Viennese Cattle Powder, which has been used in the Royal Prussian stables with a result, says a testimonial from the head horse-doctor thereof, that *corobe-rates* all that has been said in its praise. It is called the Alimental-sanative Cattle-powder. This wonderful powder "removes all miliary fevers, lacteous tumours, inspissation of the milk, by its use the gourd-worm or fluke, as likewise all emphysematous appearances are ever rarely or ever met with in cattle." A variety of it called the Anti-sphacelous-swine-powder has been used with similar success for all diseases in Tigs—the Viennese English, we presume, of Pigs.

Here is a more unexceptionable specimen of Austrian-English in the prospectus of the "Zoolog.—Botanical Society of Vienna. The universal Exhibition, to be opened at London in the course of the present year, being intended to give a conspectus of not only of industry, but also of intellectual pursuits through the whole civilized world, the above-named society thought it perfectly adequate to give notice of their existence and activity, the society's earnest, although unassuming endeavours to promote and diffuse knowledge of natural science, making it their duty to give the greatest extension possible to their scientific connexions. The following brief exposition may give an idea of the society's origin and tendencies. The science of *an*organic nature having been endowed with a dignified and permanent centre of union by the foundation of the Imp. Geological Institute of Vienna, the weekly meetings of friends of Natural Science in this town came to their end; so that organic Natural Science, especially Zoology and Botany, fell back again into their former isolated situation. Some zealous friends and votaries of these sciences met on April 9th, 1849, with the purpose to devote any intellectual and material means in their power to the diffusion of both these branches of organic natural science, by laying the foundations of a society intended to promote their aims by periodical meetings, publications, establishment of a national museum, distribution of zoological and botanical specimens among establishments of instruction and intercourse by correspondence and exchange of publications with scientific institutions in the widest sense of the term. Presently the society numbers 1,010 Fellows. The annual contribution for every Inland-fellow is 4 Austrian florins [about eight shillings], for which sum he is entitled to receive a copy of the publications of the Society. Foreign-fellows are *free* from contribution; they may, however, claim a copy of the Society's publications by paying merely the amount of an annual contribution." This is such a different aspect of Viennese life to that with which we are, nationally, familiar, that it is pleasant to dwell upon it, and to know that in doing so we may be the means of increasing the numbers of the "Foreign-fellows" so ambiguously placed on the free list. Danish English is excellent. Here is a Danish prospectus which recalls the cool, sea-green, almost grotto-like effects produced by displays of suspended maps. It relates to the execution of an Atlas of Denmark, on a scale so large that all the smaller objects in the country, such as estates, houses, churches, lighthouses, milestones, may be easily found, unobscured by the larger objects, such as woods, market towns, bogs, &c., by L. Both, topographer. It is to be lithographed by A. Bull, and published by Chr. Steen & Son, Copenhagen. The typographical division of the Danish state, notwithstanding annual aid from the State, has been for twenty years at work upon a similar atlas, but up to the commencement of the present year only one-eighth of it has been completed. The Government having liberally allowed these surveys to be taken as the basis for the proposed atlas, the enterprising L. Both hopes to accomplish his task in two years. To return to English-French. Koch, cabinetmaker and *manufactory* of articles for photography, repeats over and over again, only varied by dimensions and prices, the following cabalistic announcement:—"Black Room for 27 and 33 ports id and vues and Latter end broken Sqes rooms 8 f to more." What can be the interpretation thereof? Doubtless the "inland-fellows" who have carried away our British-French will have their laugh at us too. We noted that the French and Italian advertisements of W. Boulton & Sons, needle manufacturers, were corrected with patches that covered the errors of "printers."

It is not solely the mistakes in the international advertisements that render them curious. Messrs. Powell, of Whitefriars, append an advertisement to their prospectus that appeared in the *Tatler*, August, 1710, which carries us back to those wit-abounding, coffee-house congregating and tavern-haunting times:—"At the Flint glass-house in White Fryars near the Temple are made and sold by wholesale or re*tale* all sorts of Decanthurs, Drinking Glasses, Crewets, &c.; or glasses made to any pattern of the best Flint, at 12d. per pound; as also all sorts of Common Drinking Glasses and other Things made in ordinary Flint Glass at reasonable rates." Messrs. Defries, Houndsditch, circulate a notice of their mirrors for the palace of the Sultan of Turkey, that reads like a page from one of the thousand and one tales of Scherarzade. Each mirror is to consist of a thousand prisms, and to be 15 feet high by 8 feet wide; and two of the principal saloons, those overlooking the Bosphorus, are to have four mirrors in each of them. A hundred branched-light is to burn before each mirror. Could Aladdin have found more gorgeousness in the jewelled cave into which he descended? Here is a sad-coloured contrast to this Oriental grandeur in a hand-billette, that should be charitably circulated all over the world. "When you want brushes, mats, or baskets, buy those made by the blind, which are sold at the depôt of the Association for the Welfare of the Blind, 125 and 127, Euston-road, London, N.W." A French book of 76 pages, on sanitary perfumery, tells us a few French secrets. It insidiously blames the constant use of *cosmetiques* as the cause of the too prevalent paralysis, and chronic nervous disorders, and recommends the perfumery of M. Arrault, *pharmacien-chimiste*, of Paris and Brussels, as alone safe to use. The *crême de paraffine*, composed of paraffine, oil of almonds, and rose-water, is the softest, freshest, most unctuous cold cream in the world; his paraffine soap for the beard, his paraffine cosmetic for moustaches and *les favoris*; his paraffine mixture for the lips; his paraffine *Oléo*, perfumed with roses, violets, acacias, pinks, jasmine, and vanilla for the hair, are made from sanitary *formules*, which elevate cosmetiques from a cause of ill to be positive benefits,—perhaps. Writing of "Mossoo," as we see him in Leicester-square, it has been the mode to invest him with a strong perfume, which wits have, too precipitately, attributed to unwashed linen. After reading the disclosures of the *pharmacien-chimiste*, we must take stale cosmetics founded upon a basis of paraffine into account. These are samples only of a growth of verbiage over the surface of the great show, that may be considered, perhaps, in a century to come, more indicative than anything that was there. Should we have made no note of these things?

## MR. COCKERELL'S TESTIMONIAL.

ON New Year's morning the pleasing task was performed of presenting to Mr. Cockerell, R.A., the address voted to him by the Royal Institute of British Architects on the occasion of his retirement from the presidency of that body. Owing to the state of health of Mr. Cockerell, the deputation of members was limited in number to Mr. Tite, M.P., his successor in the presidency; Professor Donaldson, senior vice-president (of last year); and Professor Kerr, honorary secretary of the Testimonial Committee. The address has been written and illuminated on a series of vellum pages, by Mr. Owen Jones; and the long list of signatures of members of the Institute, of all grades, follows on similar sheets, with illuminated borders; the whole being arranged for binding as an album *d'honneur*. As the contributors will, no doubt, in due time have an opportunity of seeing the work for themselves, it is enough to remark at present that Mr. Cockerell expressed, together with his high appreciation of the kindness of the Profession, his great admiration of the beauty of the gift. The deputation had also the pleasure of intimating to Mr. Cockerell that the portrait painted by Mr. Boxall, A.R.A., for the Institute, is ready for final completion so soon as the artist returns from a visit to the south of Spain.

The text of the address is as follows:—

"To Charles Robert Cockerell, Esq., R.A., D.C.L., F.R.I.B.A., late Professor of Architecture in the Royal Academy of Arts; Royal Gold Medallist and late President of the Royal Institute of British Architects; Associated Member of the Institute of France; Chevalier of the Legion of Honour; Member of Merit of the Pontifical Academy of St. Luke at Rome; Honorary Member of the Royal Academy of Fine Arts of Bavaria,—of the Royal Academy of Denmark,—of the Academy of Arts of Genoa,—of the Archæological Society of Athens,—and of the American Institute of Architects; Associate of the Royal Academy of Belgium; Member of the Society of Dilettanti.

DEAR SIR,—Upon the occasion of your retirement from the office of PRESIDENT OF THE ROYAL INSTITUTE OF BRITISH ARCHITECTS, we deem it our duty as the Members of that Body to place

on record the very great satisfaction which your Presidency has afforded us.

When the demise of our first President, the late EARL DE GREY, brought to a close the lengthened period during which his Lordship had so worthily occupied the chair, the unanimous voice of the Institute, in acknowledgment of your pre-eminent merits as an Architect and as a Promoter of Art, called you to take his place.

The same unanimity marks our regret that the period for your withdrawal has arrived.

It is with much pleasure that we avail ourselves of your permission to place your Portrait in the Rooms of the Institute; long to remind us and our successors of that Dignity and Courtesy, those resources of Knowledge and graces of Character, by which you did honour to the highest office in our gift.

Although now retired from those professional labours which have gained you so many trophies of success, we hope to enjoy the frequent pleasure of seeing you amongst us; and still more we trust that England may long have the advantage of including in the number of her artistic counsellors one whose reputation is so long established and so widely spread.

We remain, Dear Sir, very sincerely yours,
WILLIAM TITE, President."
&c. &c. &c.

## FROM PARIS.

THE last report of the Prefect of the Seine contains some interesting information. The quantity of water derived from the Seine for the use of the town of Paris, which was five millions of mètres cube in 1855, has now increased to fifteen millions of mètres (the mètre cube being 1,000 litres, or 220·10 imperial gallons). By the extension of the hydraulic *reseau* it is expected that *borne-fontaines* will be established in the principal streets of Belleville, Montmartre, Batignolles, Passy, Auteuil, Vaugirard, Petit Montrouge, and the Gare d'Ivry. The waters of the Canal de l'Ourcq have been already conducted as far as Grenelle, and below Vaugirard. The service of lighting the streets, composed of 21,248 burners at the time of the annexation of the suburban communes, now consists of 23,315 burners. This number will be increased to 23,515 next year. The group of sewers and water-courses has been considerably augmented: the main channel of the boulevards, prolonged from the Rue Louis le Grand to the Boulevard de Sebastopol, will receive, in 1863, one of the principal arteries of the distribution of the water supply; so that the ancient conduit of the Seine waters, whose repeated leakages have caused so much trouble and danger, will be no longer requisite. Owing to the works executed in the main sewer of the Boulevard de Sebastopol (right bank), the superabundant waters of the Canal Saint-Martin, formerly allowed to run to waste, are enabled to be conducted to the Egout des Quais, in which an economical system of waggons and boats has been organized to transport the mud from the Boulevard de Sebastopol and the quays, as far as Asnières. In the quarters of the Faubourgs Poissonnière and Montmartre, the works of sewerage have been executed with a view of preventing the recurrence of those overflows and inundations of rain water which caused great damage in showery weather.

On the left bank of the river the most important structure is the tunnel of Saint Victor, which has been constructed to conduct the river Bièvre into the Seine, at a point below the Chaillot waterworks.

In the suburban zone the principal ramifications of the drainage system are being laid down. The most important "collector," that which is to supersede the insufficient sewer of the Rue de Flandre, is already in a great portion completed; and henceforward the quarters of the Combat and the Quai de Jemmapes will be also free from disastrous inundations during the rainy season.

The neighbourhood of the Chemin de Fer de Ceinture, at Auteuil, has been completely drained; and on the left bank the Rues de Vaugirard, de Sèvres, de la Chaussée, du Marne, and du Transit, have been thoroughly cleansed by the same system.

Consequent upon the demolition of the Pont Louis Philippe, the reconstruction of the Quai Napoleon was commenced, and is now completed: the face-wall in continuation of it has been likewise terminated, and the finishing touch is being given to this inclosing quay-wall of the cité, by the Quai de l'Archéveché, of which the last portion is in hand. The conclusion of this work happily coincides with the completion of the restoration of the cathedral of Notre Dame, so that nothing will remain much longer to prevent this thoroughfare, so long blocked up with materials, &c., from being again opened for circulation.

The Quai de l'Archéveché stands on the site of a portion of the ancient ramparts of the cité borders, on the south the lands formerly occupied by the palace, at first episcopal, but subsequently archepiscopal, of the diocese of Paris.

In the first court of this palace were held, besides the ecclesiastical tribunals, those of Monomachia, or judicial duels. In another court, between the great sacristy of Notre Dame and the Episcopal chapel, was the Archbishop's Prison, one of the most antique as well as the most deadly of Paris: it contained *oubliettes*, humid and obscure cells, in which thousands have perished unrecorded and forgotten.

Near this was also the Prison of the Chapter of Notre Dame, where the canons incarcerated, *pêle-méle*, in 1252, the inhabitants of Chantenay who refused to pay some new contribution that the chapter had levied.

Queen Blanche, the mother of Saint Louis, soon apprised of the situation of the unfortunate peasants, sent a request to the chapter urging them to set the prisoners at liberty, and offering her own security for the payment; but their answer to the Queen-Regent was to the effect that no person had a right to interfere in their affairs; and, to show their increased insolence, they seized the wives and children of those already confined, and added them to the number, *in heaps*, as the space was confined. The Queen, roused with indignation at such cruelty, went at once in person to the very doors, caused them to be broken open, and rescued the inhabitants of Chantenay, who, half suffocated, and fainting from inanition, fell at the feet of the Queen to implore her protection against their persecutors. (*Vide* "Histoire du Diocèse du Paris," par l'Abbé Lebreuf.)

It was in the grand hall of the palace above mentioned that the National Assembly held in Paris its first *séance* after its return from Versailles (19th Oct., 1789); and it was there, also, that the possessions of the clergy were declared the property of the State.

With the exception of the statues destined for the decoration of the new terminus of the "Nord" Railway,* the elaborate, though massive, ornamentations of the exterior are in a great measure completed: the extreme pavilions have been completely disengaged of their scaffolding; as likewise the intermediate galleries; so that the architectural features of the edifice can be appreciated. The gigantic series of arches of the central pavilion, the tall fluted columns, and the immense pediments surmounting the whole, are now entirely visible. The bold outlines of this façade, its noble width, and its sobriety of detail, contrast forcibly with the general style of the Paris edifices in this epoch.

Of the twenty-three statues which are to complete the decoration, the nine principal ones are,—the town of Paris, at the summit angle, due to the chisel of M. Caveiller; over the four pilasters on the left side, those of Brussels, by M. Jouffroy; St. Petersburg, by the same; Amsterdam, by M. Gumery; Frankfort, by M. Thomas. On the pilasters on the right side we have London and Vienna, by M. Jaley; Berlin, by M. Péraud; Cologne, by M. Moreau. The fountain statues in the arcades are Amiens, Lille, Beauvais, Cambray, St. Quentin, Boulogne, Compiègne, Rouen, Arras, Laon, Calais, Valenciennes, Dunkirk, and Douay. All of these are at present in temporary aërial workshops or *logettes*.

On the keystone of the principal arch a head of Mercury represents "Commerce," and having for *pendans* two medallions inserted into each pier, right and left, representing Jupiter and Neptune; while, in the pavilions of the angles, the corresponding panels will contain the emblems of fire and of water, the two bases of steam locomotion. The tympana of the two lateral entrances of the departure court are also to be ornamented with sculptures, the principal subjects being—in one, Papin; and in the other, Watt.

The ground occupied by the new terminus is said to be about 40,000 square mètres, or 9 acres, 3 roods, and 14 perches. The façade is 180 mètres (590 feet 7 inches) in length. The station is in the centre of the façade, and comprises a vast hall 70 mètres (229 feet 8 inches) long. This will be covered by a roof sloping on each side, and be divided into a nave of 34 mètres wide, and two side aisles of 18 mètres each; the separations being made by cast-iron columns, which bear a portion of the weight of the iron roof.

The Paris Chamber of Commerce is now erecting a large building at the corner of the Avenue Trudaine and the Rue Bohard de Saron, intended, according to *Galignani*, for a commercial school. The building will contain four class-rooms, each capable of containing 100 pupils; three amphitheatres for lectures, the largest of which will hold 250 persons; a spacious drawing-school, a gallery of natural history, and a library. The whole building, including the courts, will cover a space of about 3,000 square mètres. This establishment is especially intended for the children of the working classes, who will there receive, in a four years' course of studies, at a very low charge, an excellent business education for clerkships, &c. The course of study will include modern languages, mathematics, physics, drawing, natural history, geography, &c. In the evening there will be classes for adults.

* See page 603, vol. xx.

## WORKS IN MELBOURNE.*

THE event of the moment has been the opening for traffic of the great trunk line as far as Castlemaine and Sandhurst. The line cannot yet be said to be completed, and hence many of the excursionists had to suffer great inconvenience; and not a few amusing incidents occurred to render the opening day to Sandhurst permanent in the recollection of the guests. The line was opened a certain distance in April last, so that the portion opened is about fifty-seven additional miles. In this space some of the greatest engineering difficulties have been met with;—two tunnels, each nearly a quarter of a mile long, besides several fine viaducts. Although the whole of the works have been executed in the most substantial manner, yet it does seem that some at least of the gradients need not to have been so steep; Sandhurst being situate beyond the dividing range that had to be crossed; and this is done at an altitude of 1,950 feet, within a distance of 45 miles of the sea level. One viaduct is of five spans, 130 feet each, and 120 feet high. This is over the valley of the Back Creek. That over the Coliban consists of five arches, each 60 feet span, and 70 feet high. The openings were duly attended to with triumphal arches, banquets, balls, &c., according to the time-honoured custom. The line to Castlemaine and Sandhurst will not be fit for goods traffic much before January in the new year. In the *Illustrated Post*, sent herewith, will be seen a view of Castlemaine on the opening day there. Castlemaine itself is a good inland town, possessing some fine public buildings. Sandhurst is not so attractive in appearance: probably it was seen at a disadvantage. The immense crowds which went thither by rail and otherwise, and the dust and heat, rendered the place almost insufferable to a stranger.

And, before quite leaving the railway inauguration, it may as well be noted that his Excellency the Governor has been in great requisition for the laying of foundation stones for churches during the last month. On the 20th of last month Sir Henry Barkly officiated at the laying of a foundation stone for a new Independent Church in Collins-street, Melbourne, for which Mr. Thomas Watts is architect. The notices in the local papers say it will be in the "Roman Corinthian style," the tower will be 100 feet high, and accommodation will be provided for 400 persons. The total cost will be 5,000*l*. Then, again, during his visit at Sandhurst, he laid the foundation stone of a new Wesleyan Church in Forrest-street, which will cost about 3,500*l*.; and the next morning he performed the same ceremony for St. Peter's (Church of England), Eaglehawk, Bendigo. On all occasions he was presented with handsome silver trowels suitably engraved. As his Excellency has frequently during his stay amongst us been called upon to perform this office, and has on each occasion been presented with silver tools for the purpose, it is to be feared that the freight for his effects will be considerably increased when he takes his departure.

In the *Illustrated Melbourne Post* before alluded to will be found several illustrations which may be interesting. One of Melbourne-street architecture,—a building erected in 1858 and 1859, by Mr. Edward Sayce, from designs by Mr. T. J. Cronde, at a cost of upwards of 4,000*l*. It was built for incoming tenants, who took a lease for ten years, at 1,300*l*. per annum; but having lately failed, the landlord has been compelled to

* Our correspondent's communication was saved from the wreck of the *Colombo*.

subdivide and let to various parties. A new insurance company (the Australian Alliance) started under the most auspicious circumstances, has secured the corner shop; and it is understood that the collective rent-roll is now little short of 1,000*l.* There is rather a singular history about this property that may not be uninstructive to the readers of the *Builder*. The ground landlord, a Mr. T. B. Payne—so rich, it is said, that his greatest trouble is, that he has some 60,000*l.* hard cash for which he cannot find a satisfactory investment—leased the property to Mr. Edward Sayce for twenty-one years, at, say 200*l.* per annum, one of the covenants in the lease being that the premises should be insured in the name of the ground landlord. In the course of a few years Mr. Sayce availed himself of some share in a building society of which he was a shareholder, and built a store upon a portion. The rules of building societies requiring that these premises should be insured in the names of the trustees, Mr. Sayce insured *only* in the name of the trustees, and this had been done innocently for years, and the property became cleared from the building society before the breach of the covenant was discovered; when, although the ground landlord had suffered no harm, he stepped in and asserted his prerogative by compelling Sayce to enter into a new lease, and to spend no less than 4,000*l.* upon the ground. It is considered a very nice point; and the opinion of several eminent counsel here and in England has been taken against Mr. Payne. Yet it is so nice that Mr. Sayce would not try it in court.

The Patent Septaria Cement Company have just placed a sample of their cement in the market, and the trials given are highly satisfactory. It will be a great boon to the colonies, as it is with great difficulty that the imported article can be received sound, and consequently many good jobs have become prematurely decayed.

## BRONZING CAST IRON.

THE ornamental cast-iron balcony which decorates the façade of the Théâtre Français in Paris* has been the object of a new application. It has been covered with a coating of electro-metallic paint, which gives it an aspect of bronze, the tone being something between the artistic and the antique green. Galvanoplastic copper reduced to an impalpable powder is the principal substance employed in this system, of which the above balcony affords the first specimen. The paint is laid with a brush upon the cast-iron, which has previously received a protective coating, and it is bronzed afterwards by a chemical process connected with galvanized coppering. It is said that the results of experiments which have been carried on for as long as three years past, promise important advantages from the use of the process. It is very different from the usual bronze powders, which are subject to considerable alteration from atmospheric influences, as it is reported not to have suffered in the least from continued exposure.

## DESTRUCTION OF THE PLYMOUTH THEATRE AND ROYAL HOTEL.

A FIRE broke out quite early on Tuesday morning last, in the fine pile of buildings known as forming the Royal Theatre and Royal Hotel, Plymouth, and may be said to have destroyed it. It was built by the corporation in 1813, at the cost of 60,000*l.* If we mistake not, the late Mr. Folston was the architect. The north front is 275 feet long, and has in the centre a portico of the Ionic order, under which are the main entrances to the theatre and Assembly-rooms. The hotel occupies all the eastern front, and has also an Ionic portico. The columns are left standing, but the roof that attached them to the building fell in early. In the interior the whole of the grand entrance to the boxes and the upper boxes, as well as the vestibule of the theatre, have been destroyed; also the grand lobby entrance and the staircase leading to the Assembly-room.

The interior of the theatre remains, but all the decorations and fittings are demolished. The lessee, Mr. Newcombe, had just completed alterations and repairs in the theatre costing 3,000*l.*, and had obtained a renewal of his lease for fourteen years. He is not insured. The house had been crowded to see the pantomime, and the manager, after the most careful examination, went home; so satisfied, nevertheless, that something was wrong, that he had opened the door of his house to return to the theatre when a fly came up to the door. "I know what it is," said Mr. Newcombe; "the theatre is on fire." There was great difficulty in obtaining water. No one knew anything about it, and the plug-keys were nowhere.

It has been mentioned, and is worth note, that the party-wall between the theatre and hotel does not go through the roof, and so the fire passed from one building to the other.

* See p. 603, Vol. XX.

## DESTRUCTION OF CHESTER TOWN HALL BY FIRE.

THIS old and interesting building has ceased to exist. The Exchange and Town Hall formed a spacious pile, erected in 1695-8, and embellished during the mayoralty of the Earl of Derby in 1702. The structure originally rested on stone pillars, admitting of a public thoroughfare beneath; but in 1756 the west side was filled up with a row of business premises (which were subsequently converted into police offices and bridewell), the alteration being made to increase the general stability of the edifice. The Exchange had from time to time been improved; and a few years ago the sum of 2,000*l.* was expended in renovating and decorating the building. The fire broke out in the council chamber. Before the efforts of the Fire Brigade could be brought to bear upon the roof, it was one mass of flame, and gave way in a very short time. The adjacent cathedral and bishop's palace, as well as the new Market Hall, were also exposed to danger. The Exchange was surrounded with portraits of civic celebrities. There were also numerous portraits of benefactors to the city charities, with an enumeration of their several legacies. Almost all the paintings are lost or injured. A figure of Queen Anne, fixed in the south side of the building, is preserved. The Exchange was insured for 5,000*l.*

## THE WEST LONDON MAIN DRAINAGE.

THE plan proposed by the engineer of the Board of Works to pass the drainage of a large part of the western metropolis to a space of open ground, near Cremorne Gardens, and, after a species of deodorization, to the Thames, has just now caused much surprise, although announced long ago. The district which it is proposed to drain in this way, contains a large and rapidly increasing population. The space will yield 1-11th part of the metropolitan sewage, amounting to about 16,000,000 gallons. This it is proposed to collect into reservoirs of two acres in extent at the spot above mentioned, and deodorise with perchloride of iron. In connection with the subject the medical officers of health of the metropolis have held a second meeting, which was presided over by Dr. Thompson, of Marylebone, when a motion was carried, that in the opinion of the Association of Medical Officers, the proposed deodorization of the sewage of the western district of the metropolis, and its subsequent discharge into the river Thames, will be ineffectual in its operation, pernicious in its effect upon the river, and subversive of the principle upon which the interceptive schemes were originally based. If with our increased knowledge a plan had been proposed to pass the sewage to some of the wastes farther west, with a view towards making it useful, the plan might have been more readily accepted. The engineer will find it desirable to give a full description of the plan intended to be pursued.

## RESTORATION OF THE CHANCEL OF DARTFORD CHURCH, KENT.

THE parish church of Dartford was re-opened on Tuesday, December 23rd, after having been closed for some time past during the restoration of the chancel. The chancel of Dartford church, without pretension to any beauty or delicacy of detail, is unusually well proportioned, spacious, and lofty; but before the late restorations, the fittings and arrangements were such as to rob it of its due effect in the most complete manner. The arch, reveals, and cill of a grand east window (the work of Haymo de Hethe, Bishop of Rochester, A.D. 1333) still remained, but the tracery had disappeared; the opening was partly built up; and a squat window, with a four-centered head, had been substituted. The usual wooden altarpiece with cornice, pediment, and pilasters, appeared above the communion-table. The space within the rails was narrow and confined, and was further cramped by two large tombs, one on each side.

The roof, formed of pairs of crossed and braced rafters without principals, had a lath-and-plaster ceiling, except a portion at the east end, which was ceiled with painted deal, divided into panels by a moulded rib, having carved oak bosses of good Late character at the intersections. The only seats in the chancel were some rows of open benches, of mean and inconvenient form, facing westward, and four high pews, part of two considerable clusters which had formed round each pier of the chancel arch. In one of these clusters stood the pulpit, reading-desk, and clerk's desk. The arch itself was extremely low, cutting off all view of the chancel roof from the nave: it was also segmental and partially crippled. Whatever its effect might have been when the rood-screen and rood existed, there is no doubt that in its late form it was extremely ugly and inconvenient for sight and hearing: with this view the vicar and churchwardens (having taken professional advice as to the safety of such a course) cut up the opening, and substituted an arch of suitable proportion, shortly before the present works were taken in hand.

The whole area of the chancel has now been cleared out. Massive oak seats have been arranged stall-wise, leaving a wide central passage, and ample space eastward. A new prayer-desk and lectern have been placed on the south of the chancel arch, and the old Elizabethan pulpit—a good specimen of its kind, has been carefully restored, and slightly lowered, but still remains in nearly its original position. The inappropriate font, which stood in the south aisle of the chancel, has been replaced by one of suitable character, near the western entrance. The chancel-floor is laid with Minton's tiles. A new east window has been inserted, filling up the whole of the original opening. In taking down the modern filling in, fragments of tracery of two previous windows were found, but nothing sufficient to render possible a restoration of either. An old view of Dartford church shows what was said to be the original window of Haymo de Hethe, but it is too rude, and evidently incorrect to be taken as a guide. The architect, therefore, thought it better not to attempt a restoration, but to make a new design, with tracery symbolizing the dedication of the church to the Holy Trinity. Below the east window is a reredos of incised alabaster, and inlaid marbles; the rest of the east wall below the window-cill being faced with chalk, firestone, and encaustic tiles. By the removal of the two large tombs from within the altar-rails, the remains of a credence niche and double aumbry were brought to light on the north side, and a piscina on the south; besides a large arched recess occupying the position of a sedile; but which may, perhaps, be "the sepulchre," of which record exists. It is said to have been in the north wall, but a careful examination on removing the plaster, failed to discover any traces of its ever having existed there. The late vestry doorway which cut into the arch of this recess in an awkward manner, and interfered with the altar-rail, has been moved into the south aisle, and the arch restored.

All remains of ancient work, windows, and arches which have been built up; niches, steps, and doorways to rood-loft, &c., have been carefully opened and preserved. The old ceiling has been removed, and the fine oak rafters exposed, repaired, and renewed where necessary. The roof is now ceiled between the rafters, and decorated with colour.

The tomb of Sir John Spillman (said to have been the first papermaker who settled at Dartford), which formerly stood within the rails, has been placed under the arch of Becket's Chapel, and the sides closed with a light metal screen. All remains of ancient brasses have been affixed to the walls, as near as possible to their original position. In the body of the church the stonework has been cleaned, and the walls replastered, but the high pews and galleries remain for the present, as well as the modern roof and ceiling, and the mutilated corner of the south aisle, which was cut off, and neatly rounded in brick, to improve the street in the old coaching days. It will thus be seen that much still remains to be done.

The whole of the woodwork in the chancel is of oak, and has been executed by the Messrs. Melton, of Dartford. The carving is by Mr. Earp. The mason's work has been executed by Mr. Miles, and the plastering by Mr. Bolt, both of Dartford.

The east window is filled with stained glass, by Messrs. Heaton, Butler, & Bayne, who also executed the reredos, and a memorial window in the south aisle. The metal work, including the gas

standard, altar-rail, and screen before mentioned, is by Messrs. Peard & Jackson.

The cost of the restorations has been about 2,000*l*. The architect was Mr. Arthur W. Blomfield; clerk of the works, Mr. G. M. Bates, of Stevenage.

## THE STRAND.

### THE "COURIER" OFFICE.

IN a late number of the *Builder* you state that, in a room of the first-floor of the house No. 345, Strand, "at one time the office of the *Courier*, Lord Palmerston is supposed to have made his maiden speech." In this, I think, you are mistaken. The house of which you speak was the office of the *Courier* only in its latter days, previous to which it was in a house further westward. In a little book, "A Companion to the Theatres," which I wrote in 1829, in the frontispiece, the *Courier* office is shown to be the house east of the English Opera-house entrance. The *Courier* house front, which I remember many years, was of Egyptian character in the lower floor, and is shown in Cooke's nice print, "Old Exeter Change." It was, I think, removed on making Wellington-street. In the "Picture of London" for 1810, it is stated to be No. 348, Strand. Still, I am not certain that this was the Palmerston house; for the *Picture of London*, 1806, among the evening papers, gives, "*The Courier*, opposite Somerset House." Now, here are *three Courier* offices; and, as Lord Palmerston began his political career in 1806, his maiden speech to which you refer may have been made in the last-named house: the *Courier*, indeed, seems to have changed its office as often as its politics. Excuse this "cart-rope" note; but identification of London localities is a dear subject with your old reader,

*Gray's Inn.* JOHN TIMBS.

## "THE *BUILDER'S* BREAKFAST."

AN "unemployed workman" who regards "The *Builder's* Fire" as now "an established institution," proposes that another of our suggestions should be called "The *Builder's* Breakfast," as being a cheap, good, and fitting adjunct to "The *Builder's* Fire." Though evidently an Englishman, he becomes quite eloquent on the merits of Scottish oatmeal porridge;—or rather of a new formula of his own for the use of oat-grits not quite ground to meal; as a nutritious, pleasant, and wholesome breakfast for the working man, whether employed or unemployed. He says he cannot "stomach" the real Scottish porridge (though Her Majesty relishes it); but he takes a fourth or a third of a pint of oat-grits (cost 1½d. or 1½d.) and puts it into a quart jar, which he fills up with water and sets by the fire (in the oven or on the hob) for six to twelve hours, when it forms "a beautiful thick farinaceous substance, very palateable; particularly so if you can give it a dusting of sugar and take it with a cupful of milk." This, he says, forms "a breakfast fit to set before a king." The usual mode of making porridge in Scotland is different. The oatmeal is simply stirred into boiling water, and boiled for half an hour till thick and pasty, a *quantum suff.* of salt being put in; and it is supped —or eaten, as an Englishman would say,—with milk; or failing that, with treacle, sugar, or beer. It would be well for an English cook, however, not to stir the dry meal into the hot water, otherwise "knots," offensive to the taste of many, though purposely produced from liking by others, may be the result. This is easily avoided by first moistening the meal with cold water; and then pouring it, by degrees, into the hot water; stirring meanwhile with a "porridge stick" or long spoon; and the stirring must be kept up every few minutes, till the porridge be fully cooked, otherwise it may "singe," and acquire a disagreeable flavour. Oatmeal, we may add, also makes a cheap and excellent substitute for more costly "stuffing," as in a small "flap" of mutton or veal. It is first mixed with a little finely-minced suet and onions, peppered and salted, and then moistened with a little water. Those who once know the savoury taste of such stuffing, are likely to stuff themselves with it again and again. Oat cake, such as the Princess Alice begged from a cook in "the land o' cakes," makes a capital lunch, with a little bit of cheese, and is much used in Scotland, in preference to wheaten bread itself. It is simply made with water and salt, rolled into very thin paste, the thinner the better, and cooked on an iron plate, or in a hot oven. In buying oatmeal in England it ought to be tasted; and if bitter it is bad and should be rejected.

## ARCHITECTURAL INSTITUTE OF SCOTLAND.

THE council, in their report which was read and approved of at the annual general meeting of the Institute on the 5th of December last, state, with reference to the endeavours they made to obtain such a representation of the state of architecture in Scotland, at the International Exhibition, as might be worthy of the country, "that complaints were made by exhibitors that the Scotch drawings were not favourably placed. Remonstrance was made with those in management in London, but without effect; and it will be for consideration, upon any similar future occasion, what steps shall be taken to secure for Scotland an equality of position with England."

Some misconception on this head must surely exist.

The following is an abstract of the treasurer's accounts with the architectural Institute of Scotland, for the year ending 31st October, 1862.

*Charge.*

| | | | |
|---|---|---|---|
| 1. Balance— | | | |
| In treasurer's hands at close of last account | £0 14 6 | | |
| In account with British Linen Company at ditto | 99 13 4 | | |
| | | £100 | 7 10 |
| 2. Annual subscriptions, 1861–62, received | | 105 | 0 0 |
| 3. Arrears of former years' subscriptions received | | 6 | 6 0 |
| 4. Interest on account with British Linen Company to 15th April last | | 3 | 2 6 |
| 5. Special fund for endowing a chair of architecture, consigned in British Linen Company's Bank on Deposit Receipt, at 31st October, 1861 | £18 19 3 | | |
| Interest thereon, to 31st of October, 1862 | 0 7 2 | | |
| | | 19 | 6 5 |
| | | £234 | 2 9 |

*Discharge.*

| | | | |
|---|---|---|---|
| 1. Rent, taxes, &c., paid for rooms, 89, George-street, and for meeting in Queen-street Hall | | £28 | 12 9 |
| 2. Printing, advertising, &c.— | | | |
| 1. Printing | £26 17 4 | | |
| 2. Advertising | 2 16 0 | | |
| 3. Periodicals and books for Prizes | 17 1 0 | | |
| | | 46 | 14 4 |
| 3. Miscellaneous general expenses, including secretary and treasurer's outlays, postages, carriages, and expenses of collections | | 15 | 13 7 |
| 4. Subscription for memorial to Prince Consort | | 10 | 10 0 |
| 5. Amount in Deposit Receipt of British Linen Company, on account of fund for endowing a chair of architecture, dated 31st October, 1862 | | 19 | 6 5 |
| 6. Balance— | | | |
| In British Linen Company's Bank, at 31st October, 1862 | £111 13 4 | | |
| In treasurer's hands at ditto | 1 12 4 | | |
| | | 113 | 5 8 |
| | | £234 | 2 9 |

## THE FILTHY STREETS OF LONDON.

WHEN our army was in Pekin the dirty state of its streets was sarcastically commented on by many a British soldier. We wish a whole army-power of sarcasm could be brought at once to bear upon the abominable filth of the streets of London; for nothing short of that, we do believe, will shame either the authorities or the citizens out of that self-satisfied complacency which induces them even to take a pride in such nastiness, as an unparalleled evidence of "the immensity of the traffic, sir," through their wonderful city. It never seems to enter into their calculating heads that immensity of traffic implies immensity of means and resources, and therefore only renders their filth and their self-complacency under such a state of things all the more disgraceful and abominable. There is really not the slightest excuse for it.

What a subject this is for the contempt of those foreign visitors whose "dirty habits" no one is more ready to sneer at than a Londoner! It is most disgusting to be obliged to traverse his nasty streets. No wonder that leather leggings are becoming universal in such streets and among such mud-larkers!

It is some little consolation, though we believe a very poor and hopeless one after all, that the City police, at least, appear to have at length woke up for a moment to an obscure sense of the nuisance; and have issued a notice to house occupants to cleanse the pavement in front of their respective houses in the City, under a penalty of 40s., according to the City Police Act; but unfortunately the City is but the small core of the vast metropolis; and nothing short of legislation on the subject will be of any use, we fear; if even that suffice for the Herculean work of cleansing out this Augean stable.

## HOUSES OF THE DANGEROUS CLASSES.

MANY years have passed since we first pressed on the attention of the public the fact that the extent and danger of the under-currents of London society were not duly known and understood: that lying in the dark shadows of London;—bred in town swamps; and living in the midst of vice, ignorance, dirt, and social degradation, an army of rough and desperate men and women existed, unsuspected and uncared for. They are to be counted in thousands. An execution or a local riot sometimes brings them into daylight and the streets: but at ordinary times they are to be found only where they live massed together, and under such conditions that improvement is impossible. We have shown some of these slums, and how they act on the condition and character of the inmates; the effect on the children born in them; and the danger to all constantly resulting from the existence of such a state of things. From these vice-producing quarters the prisons are supplied, and in these places, when liberated from prison, the convict finds his base of operations in continuing what to him is viewed as the business of his life. These spots, this aggregation, are well known to the police and authorities, and it would seem strange that they should be allowed to remain without some efforts at suppression and distribution.

Such haunts as these, it may be noticed, generally lie in situations which are reached through complicated turnings. Take, for instance, the neighbourhood of Lamb and Flag-court, near the Sessions-house, Clerkenwell-green, where narrow courts and alleys run in all directions, like the burrows of a rabbit-warren, so that the inhabitants have the opportunity of returning to or leaving their homes in many varied directions. Costermongers and others live in parts here, but there are also many inhabitants who have for years past never earned a penny honestly. In such neighbourhoods will be found marine store-shops, the proprietors of which manage their business loosely, and in many cases are receivers of stolen goods. There are also low beer-shops, to which well-known thieves and those connected with them resort, and where *business* is arranged. The management of beer-houses calls for the attention of the Home Secretary.

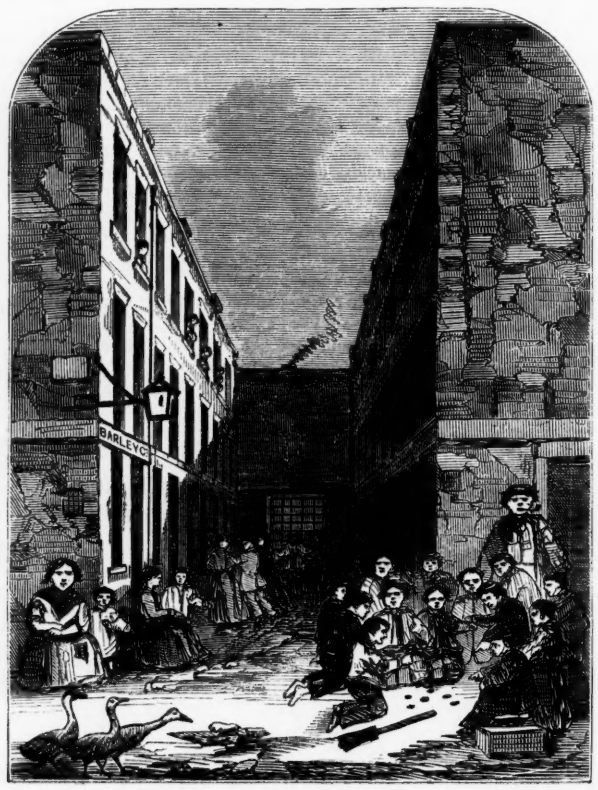
The large body of people who prey upon the honest portion of the community—the ticket-of-leave men, the returned convicts,—chiefly live in the most wretched homes; and there is every indication that although there may be short and sudden glimpses of prosperity, upon the whole the trade is a bad one, and that after all, "honesty is the best policy." Even in connexion with a successful stroke of business, a chief part of the plunder goes to the receiver, and the remainder is usually rapidly spent in dissipation, waste, and drunkenness.

Many pictures might be sketched in the locality just mentioned, but we will pass on to Argyle-square, King's-cross. At the south-west corner of this square, which is formed of good houses, inhabited by respectable families, there are some narrow roadways and passages which lead towards Cromer-street and Judd-street. Various depredations have taken place around here, and but a short time ago an old gentleman was knocked down in the open street and robbed in the forenoon and the bright sunlight. Since then a policeman has been kept constantly on duty at this point; and the officer will tell the inquirer that there is sufficient need for his supervision, for round about thieves and their companions abound.

After leaving Argyle-square there may be seen an immense cow-shed, which can often be scented from afar, and cannot be good for those dwelling around. Nearly opposite to this is a public-house, and at the side of it are a narrow pathway and a long row of houses, many, if not all of which are inhabited by thieves, and the women, and sometimes children, who live with them. In the morning, and until towards the afternoon, these houses are quieter than those which in other quarters are occupied by working people. Now and then, however, doubtful-looking characters may be seen skulking to and from these houses; but for the chief part the inmates are resting from their unlawful labours. The houses towards the front have a decent appearance, and for the most part the front doors are open. The writer knocked at the door of many rooms, but without receiving any response. Either the inmates had, by some telegraphic communication from house to house, been told that a strange inquirer was in the neighbourhood, or else (the time was between twelve and one in the day) they

## HOUSES OF THE DANGEROUS CLASSES.——*Hot-beds of Evil.*

*A Narrow Alley in the Coal-yard, Drury-lane.*




*Barley-court. Who sowed the Tares?*

were sleeping after the labours of the preceding night.

At the time above mentioned one might walk here without suspecting that anything was wrong; but as the evening approaches the dwellers come forth, and towards midnight and late in the morning, this place is a kind of Pandemonium, the women being often more violent and drunken than the men. In dealing with such an evil as this, with a community so depraved, seemingly so irremediably sunk in evil, there is undoubtedly much difficulty. They must have a shelter somewhere; but at any rate great advantage would result from having such a neighbourhood as this, during both night and day, patrolled by the police.

While making sanitary inquiries on former occasions we have visited places without any protection from the police, where neither life nor property was thought safe, and have yet usually met with civil treatment. In a long narrow court in Whitechapel, with a still narrower entrance, the children and others were dying in large numbers from fever; the drainage was shockingly bad, and the people were evidently thankful that inquiry was made with a view towards saving their lives. Many had been robbed and cruelly treated in this court, still a writer for this journal examined cellars and garrets, and other places from which it would have been no easy matter to escape; yet in this instance he did not hear a rough word. He had, before calling, purchased an old-fashioned plaster figure from an Italian, and put it in his coat pocket. After his examination of the houses, one of the occupants presented him with the figure, which had been dexterously extracted from his pocket,—whether as a specimen of skill, or as a hint that the visitor had been treated with a certain amount of hospitality, was not clear.

In the streets leading from Drury-lane there are, as our readers know well, many notorious spots. Amongst these there are, perhaps, none much worse than parts of the Coal-yard,—a place referred to by us some years ago. There, many thieves find harbour. Barley-court and some of the houses adjoining are said to be almost entirely occupied by returned convicts, ticket-of-leave men, and other bad characters, both men and women. During a recent inquest it was stated by an experienced police-officer that Barley-court was one of the worst places in the metropolis. No man could enter it with safety. Not only would he be robbed, but stripped and turned into the street. Evil women and thieves of the worst class resided there. The former were even more desperate than the latter. To say that three or four persons were robbed and stripped there every week was to say less than the reality. Dr. Bennett, the medical officer of St. Giles's Workhouse, corroborated the statement of the constable, and said it had recently come to his knowledge that a man had been robbed in one of the houses and stripped naked, and that the thieves had then rolled a blanket round him, stitched him up in it so that he could not move a limb, and thrust him in that condition into the street, with a large label, on which was written the word "Thief!" pinned over his breast. Surely the allowing of such dens of infamy to exist, in which the most notorious characters assemble for the worst purposes, shows that either the power of the law at present is not sufficient, or that the police are not sufficiently active in dispersing such dangerous communities.

One of our engravings shows a long court in the Coal-yard, which, like the other spots mentioned has several entrances. The width of this court is about 31 inches, and in one part the wooden building very nearly touches the opposite side. Barley-court is near this, and may be reached either from Smart's-buildings, Drury-lane, or other points. We last saw this locality about three in the afternoon, and found the place rather noisy. Women, muddled and tipsy, were singing ribald songs. "What shall I do when I marry a soldier?" and other choruses were taken up by drunken voices. The women here are perhaps more vicious than the men. The people crowded about were more dangerous and savage than a tribe of Caffres.

It is very disheartening to view this class of society; to consider its extent, and the little chance there is of doing good either by punishment or persuasion; and one cannot but admit that this foul blot on the civilization of the nineteenth century has been caused by many years of neglect. Houses, unfit for the occupation of human beings, were left without care or inspection; great districts rose into existence without due provision of schools or churches, and thousands of the metropolitan population were allowed to be born in filth, and reared in ignorance, bad health, and vice. Few troubled themselves to go into those places when the monster, which has become so troublesome, had been allowed to grow to strength. We have now better agencies at work. The ragged-schools effect good, and the Homes connected with them often save those who are on the brink of crime; while the reformatories for those who are young, and have just been convicted of theft, will be the means of training many into industrious habits. A strong effort, however, is needed. The children, in such spots as those we have illustrated, if left to the course of events, can scarcely escape the moral sewer: they will be swept away to vice and crime,—misery and early death. It would be *cheaper* for society to send these children to a first-class boarding school, and put them in a way to be healthy and wise, than to allow them to become, as they probably will, thieves and prostitutes. It is not even a question between prevention and cure. Educate the children downwards to convicts, and cure is very nearly impossible. If you would do anything you must prevent.

## CHURCH OF ST. PANCRAS (R.C.), IPSWICH.

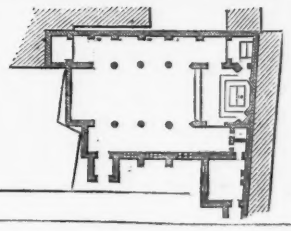
THE church, of which we present an interior view this week, has been recently completed from the designs and under the superintendence of Mr. Goldie, architect.

The site offered considerable difficulties, being at the end of a somewhat narrow garden plot: notwithstanding, a commodious edifice has been produced, capable of seating 650 persons, exclusive of standing room, for the sum of 3,400*l.*, including the elaborate altar, reredos, font, benches, organ-gallery, and various fittings. The church is built of Suffolk red brick, with occasional bands of black brick and Whitby stone dressings. The architect has not scrupled to accept the local material, brick, and use it freely internally in the arches and the clerestory string course, avoiding the employment of the more costly stone where possible. Externally the chancel is marked by a lofty *flèche* of wood and lead, with statues of angels of a large size around its base. The coupled pairs of principals shown in our view sustain this feature, and define the extent of the chancel within. The reredos is a lofty composition containing large statues of our Lord and the four Evangelists, under niches, supported by marble columns. Below are patterns of embossed majolica tiles. The chancel is surrounded by a low pierced wall, with red Mansfield stone pilasters. The baptistery runs out at the west end of the north aisle, and contains a carved font with red Mansfield shaft. Mr. Simpson, of Tottenham-court-road, late of Ipswich, was the contractor. The altar, reredos, and font, and the carving about the building, were executed by Mr. Earp with his usual skill.

HM

W.E. HODGKINS sc

Church of S. Pancras



Ipswich G. Goldie Arch.

## THE NATIONAL PRINCE CONSORT MEMORIAL.

THE designs which have been prepared by a certain number of architects in competition under terms of which we have already spoken, are to be sent to Osborne on the 13th inst., where they are to be arranged for the Queen's inspection.

## CHURCH-BUILDING NEWS.

*Horton* (*Northamptonshire*).—The church here has been re-opened, after restoration, at a cost of 1,700*l*. The aisle has been rebuilt, and also the north side of the nave. The walls are built in the limestone of the neighbourhood and the red Duston stone, in attenuating courses, irregularly banded. The walls are supported by buttresses, with Bath stone weatherings, quoins, &c. The windows throughout the church are of Bath stone, of Decorated character, all varying in design, with respect to the tracery in the heads. The roofs of nave and aisle are executed in pitch pine and Baltic fir. They are boarded on the top of the rafters. The rafters and principal timbers are stained, and the whole is varnished. The church has been entirely re-seated, and the architect has made use of the old panelled work. The tower has been stripped of its stucco and pointed throughout. The stone string-courses and other dressings have been restored, the Italian pinnacles have been removed, and the tower generally improved. The chancel has been remodelled and partly rebuilt. The roof is new, and has several principals, with curved ribs, resting upon stone corbels, carved with natural foliage and figure-heads. A three-light window has been introduced at the east end, and two two-light windows on the south side. All these, together with the three windows on the north of the nave, are filled with coloured glass. Those in the nave have been executed by Messrs. Powell & Sons, of London; those in the chancel by Mr. O'Conner, of London. The east window, by O'Connor, is filled with figures forming two subjects, one being the last event connected with our Saviour upon earth, the other that of His glorification in heaven. The former occupies the lower part of the three lights, and represents the tomb, with the Roman guards, in each of the side lights: in one of the two side lights are the two disciples approaching the entrance to the tomb, which is in the centre light: in the other side light are the three women approaching the tomb in the opposite direction. In the centre light are the two young men sitting at the tomb, arrayed in white. In the upper part of the centre light is a figure of the Saviour, and in each of the side lights a number of the glorified saints. In the tracery of the head are sundry emblematical representations and small figures. The seats in the chancel are of oak. The altar rail is of oak, partly gilded, and was executed by Messrs. Cox & Son, from designs by the architect. All round the walls in the sanctuary, within the altar-rail, is placed alabaster work, inlaid with marble and incised diapered work of various colours. On the south side is a sedilia; and at the east side, under the stone reredos, the alabaster work is continued. In the centre, immediately over the table, is a Greek cross—white, and jewelled with coloured marbles; and on either side of this are the sacred monograms, inlaid in the alabaster. This part of the work was designed and executed by Messrs. Poole & Sons, of London. The churchyard has also received attention. The works in the churchyard have been executed by Messrs. Perkins & Son, of Northampton. The whole of the works have been executed from the design, and under the superintendence, of Mr. E. F. Law, of Northampton. The building works have been carried out by Mr. Wilson, of London.

*Ayott St. Peter's* (*Herts*).—The church of St. Peter, Ayott, has been rebuilt by Messrs. Bates & Son, of Stevenage, from designs by Mr. T. G. Pearson, of London, architect; and has been re-opened for divine service. The edifice has been entirely altered, and but a small portion of the walls of the former building remain: these are worked into the present and remodelled church. The plan comprises a nave, 15 feet wide and 32 feet long, with side aisles of the same length, and 8 feet 8 inches wide. The chancel is 15 feet wide, and 22 feet 6 inches long, with a semi-circular apsidal end. A vestry and organ chamber are provided on the north side of the chancel; and over these a tower is erected, altogether 72 feet high. The nave and chancel are of equal height, and are not divided by any chancel arch, the object being to give length to the church. The apse contains three lancet windows filled with painted glass, the centre one having "The Crucifixion," occupying the principal portion of it, and the side lights respectively "The Agony" and "The Resurrection;" and above and below these principal subjects are smaller ones, as follows: "The Raising of Jairus's Daughter," "The Raising of Peter's Wife's Mother," "The Entombment," "Christ bearing His Cross," "Raising the Widow's Son," and "The Raising of Lazarus." Below these windows a reredos has been introduced (the sills of the windows being at some considerable height above the floor). The floor of the chancel is laid with Minton's tiles. The entrance of the church is at the west end, through a wide arched doorway partly in stone and unmoulded: the capitals to the columns are, however, carved. Over this doorway is a large circular window, nearly of the full width of the nave, of very simple tracery, but filled with painted glass. In the centre of the window is a majesty, and in the seven compartments surrounding this are figures representing the seven cardinal virtues in slightly tinted glass with closed borders. The nave is divided from the aisles by two plain brick arches on each side, supported on stone columns with carved capitals. The whole of the church, inside and outside, is of red brick, with stone used as weatherings only; and the windows are all simple lancets. The roofs are all open, and of deal, and boarded. The seats have sloping backs, and are made of pitch pine.

*Guildford*.—Tenders for a new Congregational chapel have been advertised for. The chapel will be in the Geometrical style, with elevations fronting North-street and the Leapale-road. The general walling will be of local stone—the Bargate—of which the new halls, the militia barracks, &c., are built, contrasting with dressings of Bath stone. The large window of the gable in the principal front towards North-street, will be 20 feet high, of four lights, with traceried head, under which will be an arcading of five bays, with three two-light windows. The interior dimensions will be 63 feet by 47 feet 6 inches, with a clear height of nearly 40 feet from the floor to the centre of the ceiling. There will be accommodation for 700. The estimated cost is about 2,500*l*. Mr. Peake is the architect.

*Whatlington* (*Sussex*).—The church of this Wealden village has been restored and re-opened. The restoration has been effected at a cost of 1,200*l*., of which the Countess Amherst, the patroness of the living, has contributed 400*l*. Both interior and exterior have undergone a change. The walls have been plastered on the exterior. The roof has been re-constructed throughout; and instead of the old bell-turret, a tower has been erected on the north side. The porch has been rebuilt. The interior walls have been re-plastered, the gallery at the west end rebuilt, and open sittings provided, beneath which hats can be placed without being crushed. The interior of the roof at the chancel is composed of cedar, which emits a pleasant fragrance; and the other part consists of oak. The whole of the windows have been re-constructed, and cathedral glass has been used for the purpose. Two new windows have also been opened. At the east end, over the altar, there is a large window composed of stained glass. In the centre there is a representation of the Crucifixion, with Mary, the mother of Jesus, at the foot of the Cross. On one side is Mary Magdalen, in an attitude of devotion, and on the other side that beloved disciple, St. John. On each side of the chancel there is a window of stained glass, with the figure of an angel having a scroll in his hand. At the west end of the building, above the gallery, is a small circular-shaped window of stained glass, in the centre of which is a triangle surmounted by a dove, descending. The pulpit and reading-desk are of oak, carved. The pulpit was made in Paris from the Rev. J. A. Hatchard's design. At the pedestal there are three figures, representing Faith, Hope, and Charity. The pulpit itself is of hexagonal shape; but, being erected against the wall, only five sides are visible. The masonry and carpentering work have been carried out by Messrs. Adams and Pankhurst, under the superintendence of the architect, Mr. S. W. Tracey, of London.

*Tenterden*.—The Ecclesiastical Commissioners, have given orders to their architect to thoroughly restore at their expense the chancel and east window of Tenterden Church. The date of the chancel being about 1,100, the new window is to be of the Early English style, and will be filled with stained glass.

*Tunstall*.—A new chapel and Sunday School have been opened here. The building is in a plain Gothic style of architecture, and the material chiefly red and blue brick. The chapel, which is over a basement story 12 feet high, comprises also a school-room, and is approached by two entrances, with staircases on each side. The floor over the entrance lobbies between the staircases is fitted up with rising pews in the form of a gallery; forms being used for the other portion of the chapel, which, as soon as funds will allow, is intended to be fitted up with low open benches. The roof timbers where seen and other portions of the woodwork in the interior are stained and varnished. When completed, the chapel will seat 300 persons, and the cost already incurred is about 400*l*. Mr. Beech, of Tunstall, has been the general contractor for the work, which has been carried out from designs furnished by Mr. Ralph Dain, of Burslem, architect.

## STAINED GLASS.

*St. Margaret's, Leicester*.—The east window of this church is now filled up with stained glass. The glass in the five lower compartments is by Mr. Willmott, and the five upper compartments by Mr. A. Gibbs, London.

*St. Alban's Abbey*.—A stained-glass window (thirteenth century), which was exhibited in the International Exhibition, has just been placed in the south aisle of the baptistery in this abbey. The window, which is by Messrs. Heaton, Butler, & Bayne, illustrates the "Baptism of our Lord," and its anti-type the "Passage of the Red Sea." The border is composed of conventional foliage, in which birds, reptiles, &c., are entwined. The arms of the Rev. Dr. Nicholson, the rector, and of the borough of St. Alban's, are also introduced.

*St. Mary's, Thame*.—The west window of this church, 20 feet by 17 feet, in the Perpendicular style, having been for some time undergoing a thorough restoration, and having now been filled with stained glass, was opened on Christmas-day. The window, designed and executed by Messrs. O'Connor, of London, was exhibited in the International Exhibition, and obtained a prize medal. It is composed of six main lights, with transverse mullions and tracery in the sweep of the arch, and is illustrative of the three great epochs, viz.—the Fall of Man, the Means of Grace, and the Restoration of Man. The idea is carried out with two subjects from the Old Testament for each epoch, thus: — For the Fall of Man—1. Adam and Eve eat the Forbidden Fruit; 2. Adam and Eve are expelled from Paradise. For the Means of Grace—1. The Passage of the Red Sea (type of Baptism); 2. Abraham offering Isaac (type of Holy Communion). For the Restoration of Man—1. The Feast of the Passover; 2. The Lifting of the Brazen Serpent. The tracery has in the lower series of lights figures of the twelve minor prophets: above these are figures of the four major prophets, Isaiah, Jeremiah, Ezekiel, and Daniel; over which again stand Noah, Abraham, Moses, and David, each figure in a separate opening: surrounding these figures are cherubim; while in the seven centre lights of the tracery are represented the seven gifts of the Holy Spirit. For this ornament the church is indebted to Mr. Acton Tindal, and his family.

*Trowbridge Church*.—A memorial window has been placed in this church by Mr. and Mrs. George Webb. The window is of stained glass. The subject is that of the Shunamitish woman and her son, from 2 Kings iv. 19 to 36. The tracery is surmounted by the subject in Matthew xix. 34, Christ blessing little children. The work was executed by Mr. Bell, of Bristol, and has been fixed by Mr. Jos. Berry.

*Rottingdean Church* (*Sussex*).—This church has been embellished by the introduction of stained glass into all the windows in the south aisle. These windows have been put up to the memory of the late Dr. Smith, by his former pupils. The windows were executed by Messrs. Clayton & Bell, of London, and represent a variety of scenes in our Saviour's life — "The Nativity," "The First Miracle," "The Call of Peter," "The Woman at the Well," &c.

## PROVINCIAL NEWS.

*Colchester*.—A new rectory-house is about to be built for the incumbent of St. Botolph's, in Priory-street. Mr. H. W. Hayward is the architect; and Mr. S. C. Mansfield the builder. The materials are red brick, ornamented with black leaders in diagonal patterns, and Caen quoins and window-dressings.

*Poole*.—The new Sunday schools of St. James's, Poole, have been opened. They are capable of accommodating about 800 children. The building

was designed by Messrs. Creeke & Parken, of Bournemouth: the builder was Mr. Wickham; and the painting, &c., was executed by Mr. Joseph Moores.

*Worcester.*—The new police-station premises, in Copenhagen-street, are now completed. The proposed alteration of the magistrates' court, &c., in the Guildhall, will be soon proceeded with. The new station consists of dwelling-houses for the superintendent, in front of the premises; and for a sergeant, in the rear; superintendent's office, large charge-room, six cells (the old station had but two), warmed with Haden's hot-air apparatus, which is intended also to warm the magistrates' court, &c., in the Guildhall; and ventilation and other requirements seem to be provided for. Mr. Rowe, city surveyor, was the architect of the new station.

*Swansea.*—A company has been formed here under the Limited Liability Act, and called "The Swansea Public Hall Company." The amount of capital required is 3,000*l.*, which is to be raised in 3,000 shares of 1*l.* each; and nearly 2,000*l.* have already been secured. The site selected is in the Willows-fields fronting Mansel-street, and will have a new road leading to it from Grove-place. The new hall will be on a large scale, as it is intended that it shall accommodate as many as 1,800 persons, together with an orchestra of 300 performers. The block plan, too, will be so arranged as to allow of additions being made when necessary, without inconvenience.

*Monmouth.*—There is a project on foot to convert a portion of the new Market-house—a building which unfortunately is already tottering to its foundation—into a Corn-exchange. Plans and specifications of the proposed alterations, in order to convert a portion of it into an exchange, have been submitted by Mr. C. Lawrence, builder. The designs have been sent, by a meeting of farmers, corn-dealers, and others, to the mayor and corporation of Monmouth, soliciting them to call a meeting to consider the subject of a Corn-exchange for Monmouth, and to view the drawings, &c. There is no doubt that a Corn-exchange is greatly wanted at Monmouth; but the propriety of turning the new Market-house into such a purpose is open to grave objections, both on legal grounds and those of expediency. It is well-known in the town that the upper part of the building has long been considered in a dangerous state, owing to its defective foundation.

*Sheffield.*—The new Club-house which has been for some months in course of erection at the corner of Norfolk-street and Mulberry-street for the Sheffield Club, is now completed, and opened for the use of the members. The building has been erected from the designs of Mr. M. E. Hadfield, and under his personal superintendence. The entrance-hall is approached from Norfolk-street by three steps. It has marble pedestals, in one of which is an open fire, and in the other a coil of pipes for heating by water this part of the house. A flight of six steps, 10 feet wide, with single blocks of Darley stone, to serve as pedestals for bronzes or statues, forms the approach to the staircase, and thus raises the coffee-room, which is the principal apartment on this floor, above the street level. The coffee-room is 45 feet long and 25 feet wide, and 14 feet high. There are six windows, 10 feet high and 4 feet 2 inches wide. On the ground floor are also the steward's office, a breakfast or morning room, 18 feet by 14 feet, and lavatories and retiring-rooms. Returning to the staircase, which is 5 feet wide, and entirely of Elland-edge stone, with electro-bronze balustrade, we ascend to the first floor, on which is the reading-room or library, 45 feet by 27 feet, and 14 feet high. On this floor a corridor, 6 feet wide, gives access to the committee-room and private dining-room. The staircase is continued to the second floor, and terminates in a pavilion. The billiard-room (the same size as the reading-room) occupies the front. It has a dome-light, with counter-light of ground plate glass. Adjoining is a small smoke-room, and *en suite* are dressing and bath rooms for the use of the members. On the upper floor are seven lodging-rooms for the household. There is a stone stair from the basement to this floor. Communicating with each corridor; and on the basement floor are the kitchen, offices, rooms for the steward and servants, larder, wine cellars, and a back entrance into the area communicating with Mulberry-street. The builders were Messrs. Craven, Hayball, Pitt, Harrison, J. & C. Ellis, and Kitchen. Messrs. J. & J. Rodgers have executed the painting and decorating.

*Scarborough.*—The Scarborough Cliff Hotel Company's directors have resolved that early in January tenders shall be sought for the old material of such of the houses on the east side of St. Nicholas Cliff as may then be in possession of the company, with a view to a portion of the site of the proposed hotel being cleared by March or April next.

## THE STAGE.

*Haymarket Theatre.* — Shade of Johnson! "Rasselas" in a burlesque! Yet so it is; and what the burley objurgator of puns would say if he knew that his story was made the groundwork of a Christmas extravaganza may be guessed. Pieced with "Dinarbas," it has served Mr. Brough, and gives an opportunity for the display of some *quasi*-Egyptian scenery, and for the introduction of Miss Louise Keeley to the stage of the Haymarket. The first scene would not bear archæological criticism, but it involves water, mountains, and piled-up Martinesque buildings; and is gay and effective. Originally the piece was intended to introduce a panorama of the Holy Land, as visited by the Prince of Wales; and Mr. Telbin, as we stated at the time, journeyed through the country with his son, and made the necessary sketches. Fever, however, on his return was the consequence of his travel, and unfortunately prostrated him, so that the panorama is postponed. It is to be hoped, however, that we may still have it. The Holy Land portrayed by the able hand that set forth Killarney last year at the Lyceum, would be an enjoyment. *Lord Dundreary* still runs his course at the Haymarket, satisfactorily to the manager. But London playgoers would be glad of some variety. We are not amongst those who revile the British public for the favour they have shown *Dundreary*. We say now, as we said on its first production, that it is one of the most complete assumptions of character ever seen on the stage: the piece itself, moreover, is now very amusing, and it is well helped by Mr. Buckstone himself.

*New Adelphi Theatre.*—At the Adelphi, under the title of "George de Barnwell," a burlesque and pantomine, the work of Mr. Byron, are given, which are independent of each other, the only connexion being that of sequence. Both are good of their kind;—the first distinguished by the capital acting of Miss Woolgar and Mr. Toole (excellent artists), and some gay scenery; and the second by the remarkable performances of the two French contortionists, Bertrand and Arthur. One of these carries the dislocation of the body at the junction with the legs to the extreme of safety point, and withal in so quaint and easy a manner that the feeling of danger is avoided. They are certainly one of the sights of the day. For the first scene of the burlesque, "Where Fancy was bred," and the opening scene of the pantomime, wherein fairies by the dozen drop from the skies (happy time!), Mr. C. S. James deserves much praise for skill in his art.

## THE STORY OF THE SALE OF SAINT THOMAS'S HOSPITAL.

IT is worth while to record the history, briefly, of negotiations which led in the end to the destruction of old St. Thomas's Hospital. Work must be eventually done by a few, but a report must be made from time to time to a larger controlling body on whose vigilance depends after all the judicious and economical management of all public matters. Here is an affair which never would have drifted into such miserable confusion if the body of governors had actively looked after the grand committee, and if the grand committee had not abandoned in turn their work and duty to two or three persons.

The Charing-cross Railway Company desired to extend railway accommodation from the Borough to the West End,—a mere business, money-making or money-spending affair,—but one of very great public good; not merely of general comfort, expediting transit, and helping to relieve the crowded streets; but also it was a matter greatly affecting public health; clearing away old buildings; forcing a direct passage through lofty walls of houses; and bringing along the course of the railway a broad river of fresh country air, flowing unimpeded right up to the centre of the densest population; enabling many thousands to pass quickly and cheaply to their suburban homes; leaving their empty dwellings in town to be taken by others who had before lived in more unhealthy corners. The alley and the court are well supplanted by the lane and street. He who did live in the lane is promoted to the street; and he of the street to Blackheath or Lewisham; while the less fortunate tenant in the alley is advanced to the lane or the street,—no great good in the eyes of the rich man, but an immense gain to the poor man himself. Foolish, indeed, has been the outcry against railways,—that they have destroyed the dwellings of the poor. They have destroyed places that it was the greatest good should be extirpated: they have opened up new homes of indefinite number for the fortunate classes: they have caused to be left vacant, improved homes for those to take who cannot remove far from the centre of industry. Hence the projected railway should have been welcomed as a friend to the hospital, and encouraged in its sanitary work; instead of which, by a narrow prejudice, the railway was treated as an enemy, to be harassed and driven away, if possible. Why, even on less general grounds, the railway should have been *invited* to come within a few yards of a corner of the hospital, and to make an hospital station touching its very premises; by which means the sick, when advanced beyond the crisis of their sufferings, and being in a convalescent state, might have been carefully, and without fatigue, removed even in their beds, upon a properly constructed invalid-carriage, to a country asylum, where in purest air their recovery might have been quickened, and thus suffering, time, expense, and wages saved. If the hospital people had been alive to their own and the public interest, they would cheerfully and liberally have co-operated in a most friendly manner with the railway. The railway, seeing the liberal terms they offered, through all their negotiations, would have paid all costs of such invalid-station, and would have made most cheap terms for the conveyance of hospital patients to the country; and that might have been obtained *for nothing*,—*literally nothing*,—for St. Thomas's, which, in the course of a few years, every hospital in London will be enforced to create at the cost of many thousands,—namely, *a county convalescent establishment*. One desires that bygones shall be bygones, except that past experience must teach people to look after their affairs, and not abandon them all entirely to an active little sub-committee. Now for the money matters.

When the Charing-cross Railway were pursuing their Bill in Parliament, the hospital considered the railway would be an enemy injurious to its interests and the comfort of its patients, and opposed the Bill. A small piece of ground was required, which belonged to the hospital. It was open garden ground: to get rid of opposition in February, 1859, the railway offered, for this 1-16th of an acre, 10,000*l.*, which was refused. Again, in April, 1859, they offered 20,000*l.*, which was refused: they then shortly after offered a rent of 6,000*l.* yearly, which was refused. The Commons, however, passed the Railway Bill, notwithstanding the vigorous opposition of the hospital, who employed four counsel, Messrs. Brougham, Paget, Johnson, and Burke.

Indeed, so wildly liberal was the offer of 6,000*l.* per annum deemed by all parties, that actually the lawyers and all others on both sides agreed to it: all considered further opposition at an end; and it is said an agreement was prepared; nothing wanted but the signature of one person, which was relied upon. When, said the Authority, "Make it 9,000*l.* (!) and I will sign." The railway people, who had had time to cool and repented of their liberal terms of 6,000*l.*, broke off indignantly all further negotiation in the Commons. When the Bill was in the Lords, to get rid of opposition, an offer was made to build on a more convenient site a new wing, equal in size and accommodation to the north wing, with a new treasurer's house, church, &c. &c., at the cost of from 40,000*l.* to 50,000*l.* All was again refused.

When, at last the company got their Act, then said the hospital, "You shall take all our place—all or none: we will not let you have a part only." On this, application was made to Vice-Chancellor Wood to enforce the whole purchase under the Lands Clauses Act. The hospital employed again five counsel, the Attorney-General (now Lord Chancellor), Messrs. Rolt, Giffard, Baggalley, and MacNaughten, the railway paying, in all this litigation, only, of course, the costs after being taxed; so that three-fifths of the whole will fall on the charity. After the decision of the Vice-Chancellor it went to arbitration. Two arbitrators were appointed, who could not agree upon their umpire: probably they never intended to agree. Reference was then made, according to the provisions of the Act, to the Board of Trade. Mr. McGregor named the usual professional person, Mr. Powell, but this did not please; and at last Mr. Stewart, of Liverpool, was appointed, with, of course, the consent of both parties. Why Mr. Powell was put aside for a gentleman from Liverpool, who could know so little of London property, is a profound mystery, which may some day be unravelled.

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|---|---|
| The hospital surveyor valued the four acres of land at about | £270,000 |
| The buildings as a hospital | 106,000 |
| Inconvenience and cost of removal | 50,000 |
| Total hospital valuation | £426,000 |
| The company's surveyor | £180,000 |
| As old materials only | 11,000 |
| Inconvenience, &c. | 50,000 |
| Total railway valua on | £241,000 |

The mean of this is 333,500*l.*, and there is no doubt this sum might have been obtained. They got 296,000*l.* after having originally claimed 750,000*l.* Rumour says that the company would have given 400,000*l.*, and Mr. Powell was inclined to think 350,000*l.* the value.

The costs of all this are as yet unknown; certainly not less than 16,000*l.* or 18,000*l.* Claims of 8,000*l.* have been sent in for professional fees, and about 5,000*l.* have been paid. Here are a few of the professional charges:—Mr. Hunt, 1,050*l.*; Mr. Currey, 1,000*l.*; Mr. Clarke, 740*l.*; Mr. Marrable, 740*l.*; Mr. Pownall, 250*l.*; Messrs. Tite & Clifton, 1,480*l.*

Of all this expense the railway will only have to pay the taxed costs, which will certainly leave 5,000*l.*, out of these 8,000*l.*, to come out of the charity funds.

It must be noted that Mr. Tite had given the munificent donation of 1,000*l.* to the Medical School, so that there is a balance in the favour of his firm of 480*l.* I do not learn that any other of the professionals have allowed any such handsome discount to the charity.

That this noble charity has parted with its property for a sum much under its value—either by means of jobbery or incapacity—is well shown by the corroborative evidence that several parcels of land have been subsequently let at very different prices in the Borough. The Alliance Bank has taken a piece of ground at 500*l.* per annum rent, which, when capitalised, is at the rate of 260,000*l.* an acre. Another property has just been taken on a twenty-one years' lease, at an improved rent of 750*l.*, which is at the rate for the freehold of 298,000*l.* per acre, in no better situation than the frontage of the hospital. The site of the old Town Hall has lately been taken at 500*l.* a year; the area about 2,090 feet superficial: this would indicate a freehold value of more than 250,000*l.* per acre.

Now the hospital ground of four acres, with buildings, and including compensation for inconvenience of removal, has only obtained 74,000*l.* an acre, or 296,000*l.* for the whole. Surely it must have been worth 150,000*l.* an acre if these facts in the same immediate locality indicate anything.

I. H. E.

## COST OF COTTAGES.

SIR,—Observing in your journal of the 27th of December last a report of the proceedings of the Society of Arts subsequent to the reading of Mr. Taylor's paper on "Cottage-building and Sanitary Appliances," Mr. J. Bailey Denton is reported to have said that—

"Much has been endeavoured to be done by prizes and the efforts of various societies; but it was a fact that not one of those prize designs had provided for buildings that could be erected for the money which was stated as a necessary condition to the premium offered."

Also that—

"No point would strike them more forcibly than the fact that none of those designs could be built for anything like the price estimated."

And again,—

"A pair of cottages should be built for 200*l.* It might be asked why he had put them at that sum? The reason was this. In all the designs which had received commendation or prizes, there were none the estimates for which exceeded that sum."

Now, being the author of the design which obtained the 25*l.* premium last given by the Yorkshire Agricultural Society for a pair of labourers' cottages, to contain five rooms each, and not to exceed in total cost 220*l.*, I am able to rectify the whole of the above statements, which I am surprised Mr. Denton should have made, seeing that, as an unsuccessful competitor for the second prize, he had the opportunity of making himself better acquainted with the real facts of the case.

I need simply refer to the published report of the society, No. 24, in which my detailed estimate is given at page 37, amounting to 210*l.* 14s. 1d., and not "under 200*l.*" Also at page 23, in alluding to the actual cost of the cottages, as built by the Leeds Committee of the Royal Agricultural Society, the following remarks:—

"This pair of cottages was built for the Leeds show, just opposite to the entrance to the show-yard at Armley. The contract price for the pair was 212*l.* 10s. The cottages, as they appeared at the show, actually cost 224*l.* 16s. 5d.; but, of the extra 12*l.*, 5*l.* 12s. was for work in the foundations, in consequence of their being built over a hole, and about 5*l.* was for inscription-tablets and sign-boards, forming no part of an ordinary cottage. The pair of cottages, therefore, with the necessary out-buildings, would certainly have been built at Leeds, on level ground, for less than 220*l.*"

A large number of these cottages has since been built from my plans and specifications in various parts of the country, and there are numerous instances of the cost not exceeding 220*l.*, although there are many remote localities where materials and labour are so costly as to necessarily increase the expense beyond that sum.

Not looking upon the erection of good cottages at remunerative prices in such a hopeless light as Mr. Denton, and not wishing to discourage the stirring endeavours now being so largely made to solve that problem, must be my excuse for troubling you at such length.

JOHN ROSS
(late Richardson & Ross).

## THE CATHEDRAL AT TUAM.

SIR,—Your Irish correspondent, in the last number of the *Builder*, attributes an act of Vandalism to the architects of the cathedral at Tuam, which I can hardly allow to pass without some notice. I have much pleasure in sending you drawings, with explanatory letter-press, and a tracing which will, I feel confident, induce you to form a very different opinion as to the manner in which this difficult subject has been treated from that formed by your correspondent.

The existing structure, used as parish church and cathedral, the demolition of which is regretted by your correspondent as "a building of the fourteenth century, and containing very elaborate and beautifully-traceried windows," possesses, in fact, six windows of a most uninteresting type and coarse workmanship. Four of the six are in limestone, and in all probability of the fourteenth century: the others are imitations of them in wood, sanded and painted, and probably of the eighteenth century, to which enlightened period of Gothic art the tower also belongs. The building has been, in my opinion, constructed from the *débris* of a more ancient edifice; the only architectural features deserving such a name being the stone windows above mentioned.

The entrance to this structure is through the chancel-arch and triplet east window of a Romanesque building of great interest and beauty. To have added to the present building would have involved the destruction or removal of this unique ancient chancel for the sake of preserving a building which has no architectural or antiquarian feature of any value. This might, indeed, have been considered "unaccountable." This Romanesque building will be preserved at the east end of the cathedral.

T. NEWENHAM DEANE.

## OPENING UP CHINA.

I BEG your powerful aid to lay before the public my plan of staying the bloody rebellion in China; and at the same time developing the very many latent resources of that mighty empire profitably; employing British capital, and adding another link to the great railway and steam-boat excursion tract round the world, *viâ* Cabool, Shanghai, and San Francisco, now looming in the future (not so distant either). My plan, sir, is simply this (pray take a good map, or globe):—Get a concession from the Chinese, and make a railway and telegraph line from Calcutta, through the valley of the Burampootra, to Shanghai, one of our Chinese treaty ports. This would at once strike the admiration, excite the cupidity, employ the time and attention, and recall the minds of the people to that which they most love,—money-making. I take it that it would naturally follow that the British ideas of commercial and industrial development (in a word, political economy) would take deep root in that interesting country. A Young China party would make good progress, and a new civilization open up the vast resources of the greatest nation of the earth.

Now, sir, for the question—Would it all pay? The answer is:—To suppose a railway at the one end of which would be (India) 150,000,000 inhabitants, and at the other end still more, would not pay, would be in these times simply ridiculous; to say nothing of any traffic to Europe or America, which would take time to develop. Now that the affairs of that country are taking somewhat the attention of our public men, let them just see the thing in a feasible shape (I have for years), and it will not be so very much easier said than done.

GEO. TODD, C.E.

## COMPETITIONS.

IN the month of June last, a certain committee advertised for plans, elevations, sections, specifications, and estimates for a public hall, offering the munificent sum of 25*l.* for the set of plans, &c., adopted, provided the architect was not employed to carry out the work; and a sum of 5*l.*! for the next approved set of plans, &c.

At the present time, we find the same committee again advertising, "not having succeeded in obtaining plans strictly in accordance with their requirements."

Surely this may be regarded as a sign that "good men and true," young or old, are beginning to discern that *small* competitions are too speculative to be worthy of notice, and that in time, therefore, we may hope to be fairly rid of them.

The advertisement seems at a glance to reflect the highest credit on the discriminative powers of the members of the committee; but it also gives rise to a feeling that, if they be *thoroughly* acquainted with their requirements, it would be wise and just to put the matter into the hands of some professional man at once, since the only use of a competition is to obtain *various* interpretations of the stated requirements.

AUGUSTUS FRERE.

## LIVERPOOL EXCHANGE COMPETITION.

SIR,—I have just returned from Liverpool, where I have been to make some inquiries respecting the competition for the new Exchange there, and learnt, what probably many of your readers would also wish to know, that it was stated at a meeting of the committee, although not mentioned in the conditions, that it was intended that the *prize* of 1,000*l.* was to merge into the architect's commission.

The committee charge a *guinea* for the conditions and plan of site;—a few papers that have cost perhaps a few shillings.

AN ARCHITECT.

## THE PUBLIC LAMPS IN THE CITY.

ANOTHER report on this subject has been made to the City Sewers Commission, by their engineer and surveyor, Mr. Haywood. He states that since his last report and that of Dr. Letheby, after which the Commission resolved to burn by meter, and tried some experiments on the subject, he has found the result to be that "by the Great Central Gas Company twelve per cent. less gas is given than is contracted for, and twenty-five per cent. less by the Chartered Gas Company." In reference to certain contrary results alleged on the part of the gas companies, Mr. Haywood remarks that burning by meter will alone set all doubts to rest and do justice to all parties. Carburation he regards as an independent question; but when the gas is burnt by meter, the carburation will not be interfered with by the companies: meantime, however, the reporter expects a decided saving by this means. The fixing of the meters to the lamps is also considered. The companies, it appears, insist on a separate meter to every lamp, and Mr. Haywood recommends that the meters be fixed upon the brackets of those lamps which project from walls, and in wells or pits beneath the others; but he anticipates a more ornamental and sightly description of street lamp, in which the meter will be enclosed at the base of the lamp itself.

In connexion with this subject we may here point attention to a new lamp column. It has been purposely designed by Mr. E. H. Thorman, engineer of the West Ham Gas Works, to meet the difficulties hitherto experienced in supplying public lamps by meter, and is mounted with Burnett's patent reflecting and flame-regulating lanterns, as described in the *Builder*.

## Books Received.

*Solutions of Questions in Arithmetic by First Principles. For the Use of Teachers and Students.* By WALTER M'LEOD, F.R.G.S. London: Longman & Co. 1863.

MR. M'LEOD is the head master, model school, and master of method, Royal Military Asylum, Chelsea, and author of various arithmetical works. His present book, which he states to be the result of many years' experience, contains full solutions of questions in simple and compound proportion, per-centages, commission, interest, discount, stocks, profit and loss, and partnership, by first principles, dispensing with rules altogether; thus solving the most difficult question by multiplication and division alone, and in a simple form, adapted for elementary instruction. Every step in the solution of a problem is thus an intellectual exercise. The method is not one which Mr. M'Leod claims as his own; for it has been recommended by some of the ablest writers on education; but no one has hitherto shown this method to be applicable to difficult problems in the higher branches of arithmetic; and this Mr. M'Leod seems to do in a very efficient way, which cannot but tend to cultivate the mental power of youth.

*International Exhibition: the Industry, Science, and Art of the Age.* By JOHN TIMBS, F.S.A. London: Lockwood & Co. 1863.

WE have here for the first time, in one compact and entire form, an excellent and complete condensation of the popular descriptions in the *Times*, the *Builder*, and other journals, of the principal objects and articles exhibited in the International Exhibition which has just closed. The volume, though thus in part a compilation, nevertheless contains much new writing, as well as condensa-

tion, in Mr. Timbs's own effective and correct way; and forms a very timely, useful, and interesting compendium and memento of the Exhibition of 1862.

## VARIORUM.

FROM the "Third Annual Report of the Cranley Village Hospital," and the "Statement of the Medical Officer of the Cranley Village Hospital" accompanying it (Palmer, publisher, Little Queen-street, Holborn), we are gratified to notice that "the Cottage Hospital continues to afford all the advantages for which it was devised, and may be pronounced a decidedly successful undertaking." The public throughout the whole country are much indebted to its promoter, and active intelligent medical officer, Mr. Napper, M.R.C.S., for his exertions in realizing and establishing so useful an idea as that of village hospitals; by means of which much good will undoubtedly be done both in town and country. Would that the authorities of St. Thomas's Hospital, at the present critical moment in its destiny, would take a lesson from Mr. Napper, under the conviction which his important experiment is so forcibly corroborating, that town hospitals are far more fatal than country ones, whether on the large scale or on a small. No doubt, there is a necessity for both; but the St. Thomas's Hospital authorities can well afford to establish both, and will be inexcusable if they fail to do so. The lives of thousands in future years depend upon their settlement of the question of at least a convalescent hospital removed from malign and exhaustive town air influence.——"The Popular Science Review, January, 1863: Hardwicke." This new scientific quarterly sustains its character as a substantially good periodical. The leading papers comprise Notes of the Exhibition, concluding with machinery, by Dr. Fairbairn; War implements, by Captain Donnelly, R.E.; the Colonies, by the editor, Mr. Samuelson; and Zoology, by Mr. C. Collingwood. Among the other papers is a very interesting one on the planet Mars, by Mr. J. Breen, F.R.A.S., in which we can readily make a somewhat more intimate and familiar acquaintanceship with the ruddy Mars than heretofore. The paper is illustrated by several graphic coloured views of the planet, in which its general hue is depicted by a light and uniform dun or reddish yellow colour; its dark spots by varying intensities of black; and its polar snows and ices by the white hue of the paper. Now Mr. Breen, like other astronomers, regards the more restricted, outshapen, and varihued dark spots as the seas, and the uniform and more wide spread, and far brighter, dun coating as the land; but in this interpretation the views appear to us to be quite unintelligible: the varying dark streaks and spots seem to be much more like the continents, islands, and connecting necks or isthmuses and promontories of land than seas; while the uniform and bright dun hue (mottled in the telescope), in which the darker spots are embedded, much more clearly indicates seas. Moreover, we are deliberately of opinion that it is a mistake to suppose that the seas must be dark and the lands light in colour. When we take a bird's-eye view from a mountain-top, or a balloon, in our own planet, is not the land dark and the water bright? Are not the streams like silver threads running through a "dark ground?" and does not the sunlight glance off the ocean surface and its spray in a somewhat similar way, even notwithstanding the graver tint of its inner depths? Only let us look at Mr. Breen's coloured views of Mars in this light, and all becomes natural and intelligible. The snowy and icy spots near either pole are known to deviate from the actual poles, or axis, of the planet, just as the isothermal lines around our own arctic and antarctic regions show the snowy icy envelopes of the earth to do; the cold and fixed ice and snow penetrating farthest south where there is land. Now it is notable that in most of Mr. Breen's views the ice or snow spots, in deviating from the exact poles of the planet, occupy almost precisely the centres of dark spots; indicating, as we would conclude, that the dark spots are the land, and the wide-spread and uniform mottled dun tint the sea, as seen through a perhaps somewhat foggy atmosphere; or, as the spectral analysis people tell us, through an atmosphere tinged by the reddish hue of bismuth. It is remarkable that while Mr. Breen himself speaks of the diverse-shaded dark spots as the seas, and the uniform and mottled dun surface as the land, he also inadvertently alludes to the dark spots as perhaps indicative of varying surfaces such as forests and sands.——Lockwood's "Builders' and Contractors' Price-Book for 1863" has been revised by Mr. Geo. R. Burnell. An appendix gives valuable tables.——The same publishers, Lockwood & Co., Stationers'-hall-court, issue as usual, for the new year, "The Engineer's, Architect's, and Contractor's Pocket-Book," which includes the "Memorandum Book of Mr. Telford," and is full of valuable information.——Adcock's "Engineers' Pocket Book for 1863," published by Simpkin & Marshall, Stationers'-hall-court, contains, like the last, numerous tables and formulæ for use in mensuration, strength and weight of materials, &c., and lists of the members of the Institution of Civil Engineers, &c.——"The News Almanac" states that, in the year 1862, fourteen insurance companies have transferred their business;—that of these fourteen offices one was established fifty-nine years ago; another, thirty-six years; a third, twenty-nine years; and a fourth, twenty-eight years ago.——"The Utilization of the Metropolitan Sewage and Reduction of Local Taxation" (Kent & Co.), is a pamphlet, in the shape of a letter to Mr. Fred. Doulton, M.P., in the interest of Mr. Ellis's plan as against that of Mr. Napier. The main point of difference is that Mr. Napier's plan is based upon the principle of large dressings of sewage applied over a small area; Mr. Ellis's plan, upon small dressings of sewage, applied to all crops over a large area. The writer urges, in somewhat strong language, that Messrs. Lawes, Way, Morton, and Voelcker are too much concerned in the sale of artificial manures, and in an existing Fish Guano Company, to be quite disinterested in their opinions on this subject.——No. 1 of "The Sculptor's Journal" has been published (Lindley, Catherine-street). It is illustrated with a cut of the "Tinted Venus."——Amongst other works that have reached us are "The Fine Arts and Civilization of Ancient Ireland," by Henry O'Neill (Smith, Elder, & Co.); "A Handy Book on Villa Architecture," by C. Wickes (second series) (Lockwood & Co.); "The Practical Mechanics' Journal Record of the Great Exhibition of 1862," now completed as a fine volume (47, Lincoln's Inn-fields, and Longman, Green, & Co.); and Mr. Leeds's Edition of "Chambers." These will receive notice hereafter.

## Miscellanea.

FRENCH SORROW AND SENTIMENT.—At Montmartre Cemetery a tombstone has been erected with a colossal tear carved on it, and the words underneath,—"Judge how we loved him!"

WESTMINSTER BRIDGE AND PALACE-YARD APPROACHES.—Notice has been given to the owners and occupiers of the remaining houses situate in New Palace-yard, that they will have to vacate in the course of the month, the space being required for the new Westminster Bridge and Palace-yard approaches.

ARCHÆOLOGICAL DISCOVERIES IN ALGERIA.—There has recently been a great "find" in Algeria. The *African*, French paper, published at Algiers, contains a long account of various antiquarian treasures discovered in the course of making excavations in the French possessions. At Kreneg, nearly 200 Latin inscriptions have been found: at Lambsea many hundred objects of art have been disinterred; and extensive Roman remains, including mosaics, have been brought to light at Constantina.

IMPROVEMENT IN WHEELED CARRIAGES.—Lamentable accidents frequently take place in consequence of the wheels of carriages coming off their axles when on the road. Attempts have from time to time been made to obviate these disasters by means of complicated and expensive contrivances, for securing the nave of the wheel on the axle; and although these endeavours have undoubtedly been successful in preventing accidents in certain cases, it cannot be said that the most improved of them will ensure perfect safety; as, in the event of an axle breaking, the wheel will inevitably become detached from the carriage, which will be upset. The hitherto difficult problem of preventing a wheel from coming off the axle and upsetting the carriage, even when the axle breaks, seems at length to have been solved, to a considerable extent, by Messrs. Upfill, Morton, & Co., of Birmingham. This object is effected in so simple a manner that the expense is not great. The improved axle-box and nave are connected together so as to form one piece, and they are secured on the axle by means of tongues, which take into grooves made round the axle-tree. Unless, therefore, the body of the axletree itself breaks, the wheel cannot become detached from the carriage.

THE VIADUCT ACCIDENT AT CLAPHAM.—Means have been safely and successfully adopted whereby the subsided arches have been brought down, so that the foundations may be examined, which will next be done after the piers are removed. The cause of the subsidence will then probably be discovered, and new foundations for the erection forthwith laid.

PROFESSOR SMIRKE'S LECTURES AT THE ROYAL ACADEMY.—Mr. Sydney Smirke, R.A., delivered the first of a course of six lectures on architecture to the members and pupils of the Royal Academy on the 2nd instant, and the second of the course on the 8th. The others are fixed for the 22nd, 29th, and 5th of February. The first lecture was devoted to a historical review of the subject, and the second treated of architectural character; both founded on previous lectures, of which we have given reports.

SPREAD OF MUSIC HALLS.—A large hall, known as "Turnham's Music Hall," has been constructed in the Edgware-road, facing Chapel-street. The building, which is said to be capable of accommodating 3,000 persons, is of hexagonal form, and built in the Italian style of architecture. According to the *Observer*, its decorations are in cream white and gold. The height of the ceiling is 45 feet, and the diameter of the building is 80 feet, whilst the width of the proscenium is 40 feet, by a depth of 18 feet. The flutes of the proscenium columns are fitted with looking-glass. The cushions round the balconies are composed of crimson Utrecht velvet, and the seats in the balconies and stalls are in green and scarlet leather. The architect is Mr. J. P. Patman. In order that some idea may be formed of the elaborate character of the building, it is stated that its entire cost to Mr. Turnham will be over 20,000*l*.

RAILWAY TO CONSTANTINOPLE.—A project has just been set on foot by an engineer, named Dumont, to continue the present continental railway communication as far as Constantinople. The present European network of railways extends as far as Bazias, a small port on the Danube, 650 kilometres ($\frac{5}{8}$ of a mile each) distant below Pesth. The line from Paris to Bazias by Strasburg, Munich, Vienna, and Pesth, is about 2,100 kilometres in length, and the journey may be performed in sixty hours. This line of railway might be extended to the Black Sea and Constantinople in two directions; one by Belgrade, Servia, Bulgaria, and Roumelia, a line already surveyed by the English; and the other which would reach Constantinople by Roumania, passing by Crajova, Bucharest, Rustchuck, Schumla, and Adrianople, crossing the Balkans at the most available point, in the neighbourhood of Aidos. This is Dumont's project. The total length of the proposed lines would be about 1,500 kilometres, thus divided:—On the Austrian territory, from Bazias to the frontier of Roumania, near Orsova, 125 kilom.; from Orsova to Bucharest by Bucharest, 353 kilom.; from Rustchuck to Constantinople by Schumla, Aidos, and Adrianople, 600 kilom.; giving a total from Orsova to Constantinople of 1,085 kilom. Branches from Bucharest to Bazias and Galatz, and those from Cernavoda to the foot of the Carpathians, would be together about 400 kilom., making a total length of 1,485 kilom."

THE GREAT EXHIBITION IN CONSTANTINOPLE. *Public Opinion* translates an article, with reference to the Turkish Great Exhibition, as a specimen of Oriental journalism, from the Constantinople native paper called "The Imparter of Events." The article says:—"And within a few days definite orders will be given by the Padishah that the building be erected (if God help, and frustrate the Evil One) by the company formed under the shadow of the 'Divinely strengthened One' (the Sultan), in the neighbourhood of the sacred mausoleum of the most worthy ancestor of his Majesty the Asylum of the Universe, the late Sultan Mahmoud, now in Paradise, in the plain near the school of the Validei Mekteb, in a new and wondrous fashion. Now, although this show be specially for the things of the 'Well-guarded Empire,' yet his Majesty the Padishah, wishing to furnish the artificers and workmen who live in the shadow of his benignity an opportunity to witness with their eyes the cunning devices which, by the employment of the wondrous power, steam, and divers other contrivances, enable the Europeans to produce goods in their workshops at half the price of those wrought by hand—nay, perhaps for less—has decided that, if there be any persons who will desire to send such machines and tools, they shall be received, and that a proper and special place shall be appropriated to them in the vicinity of the show, and that such machines and tools shall be exempt from all customs duty on entering the Empire."

MONUMENTAL.—The committee appointed some time ago to raise an "Oastler Memorial Fund" have obtained upwards of 1,000*l*.. It is intended to erect a full-length statue of this "Factory King" in one of the principal towns of the West Riding, either Bradford or Leeds; the former being the place where the short-time movement originated, and the latter the birthplace of the late Mr. Oastler.

DISCOVERY OF GRANITE IN DUMFRIESSHIRE. A quarry of grey granite, said to be finer than that of Aberdeen, has been discovered at Kirkconnell, on the estate of Witham, belonging to a Mr. Maxwell. The *Dumfries Courier* states that the locality has been examined by Mr. David Stevenson, of Edinburgh, civil engineer, who reports favourably both of the material and the prospect of supply. The granite will be shipped from a jetty to be constructed at Aird's Point, facing the Carse, to which it will be sent by tramway to Liverpool, Glasgow, Belfast, &c. The freights will be only from 4s. to 6s. per ton. It can also be easily sent to Dumfries.

RAILWAY TRAINS.—Last year, 1,902,069 passenger trains, travelling 44,594,359 miles, and 1,222,617 goods trains, travelling 42,973,849 miles, were run in England and Wales; 275,825 passenger trains, travelling 5,044,655 miles, and 276,152 goods trains, travelling 6,558,777 miles, were run in Scotland; and 174,445 passenger trains, travelling 4,416,462 miles, and 30,882 goods trains, travelling 1,553,338 miles, were run in Ireland. We thus arrive at the amazing aggregate of 105,141,440 miles as the railway work of the British islands for twelve months. Every mile traversed involved an outlay of 2s. 7½d.

METROPOLITAN ALBERT STATION AND MID-LONDON UNDERGROUND RAILWAY.—This proposed subterranean line of railway is to commence on the east side of St. Martin's-lane, the station being intended to occupy Bedfordbury; running thence, at a depth below the surface of 40 feet, under the parishes of Westminster, St. George's, Hanover-square, St. James's, Brompton, Old Brompton, Knightsbridge, and Chelsea, into the West London Railway at St. Mary Abbot's, Kensington; with seven branch lines communicating with the Kensington station and North and South London junction, Warwick-road, on Lord Kensington's-park, the Kensington Canal-basin, the West London Extension, near Hammersmith, Fulham; and other points of the West London Railway. The estimated cost of the undertaking is 740,000*l*., with powers to borrow an additional sum of 240,000*l*.

BROWN'S BUILDINGS, LIVERPOOL.—The pile of buildings erected on the west side of the town-hall, by Colonel William Brown, the munificent donor of the library and museum building, has been so far completed and inaugurated. The frontage to Exchange-street is 184 feet, to South Chapel-street 143 feet, and to Rumford-street, 120 feet. The plan of the building is extremely simple, consisting of a range of buildings carried round the three fronts, with a cross range in the middle, forming the shape of the letter E, having two interior courts. There are three entrances from Exchange-street, one from South Chapel-street, and two internal staircases. There are four stories of office chambers, with vaults below the basement, and an attic at the top, containing sample-rooms, keepers' apartments, &c. The exterior is entirely built with stone; the basement grey granite from Dalbeattie, near Dumfries; the superstructure, sandstone frem Cefn, near Ruabon. The style of the design may be termed Renaissance of the Venetian school, treated freely. The centre portal on the east front is flanked by two gigantic figures, 13 feet high, on pedestals supporting the entablature. The portal on the north front has two monolithic polished red-granite columns. The central group of columns on the one-pair story are also polished red granite. The internal stairs and corridors are all of stone. In the arrangement of the interior the aim of the architect has been simplicity of plan, easiness of access, and abundance of light. The architect is Mr. J. A. Picton: the contractors are Messrs. Jones & Jump; the subcontractors for the brickwork, Messrs. Smith & Son; masonry, Mr. A. Dempster; ironwork, Messrs. W. Bennett & Sons; plastering, Messrs. Potter; and plumbing, painting, and glazing, Mr. Erlam. The sculptural decorations, of which there is a large amount, have been executed by Mr. Edwin Stirling and his assistants. At the inauguration, the architect announced the fact that the owner of the premises was now Sir William Brown, bart. Sir William was present; but, we regret to say, appeared to be in a very bad state of health.

WATER COLOUR PAINTERS' LANCASHIRE FUND. The Exhibition in Bond-street will remain open till the 17th. Application has been made to the Lord Mayor for leave to exhibit the pictures at the Mansion House for a week, and it is to be hoped his Lordship will assent. The subscription for chances goes on steadily.

GAS.—The Worcester gas company's directors have announced a further reduction in the price of their gas, from 5s. to 4s. 6d. per 1,000 cubic feet.——A portion of the permanent barracks at Aldershott has just been lighted with gas from extensive works erected by the Government on the banks of the Basingstoke canal. The gas supplied is said to be pure and good, and its introduction is regarded with much satisfaction by all ranks and branches of the service. The gasworks, it is said, were erected at a cost of 22,000*l*.

THE HOLY SEPULCHRE.—The following details relative to the works for restoring the cupola on the Church of the Holy Sepulchre are given by the *Monde*:—"The French architect and the one sent by Russia, a German by birth and a Protestant, have made a minute examination of the present state of the cupola. They have ascertained that all the woodwork is so worm-eaten, that at the first heavy squall of wind the top of the cupola might fall on the tomb of the Saviour. The architects propose in the first place to construct a provisional covering so as to protect the pilgrims and the clergy from any accident. As to the cupola itself, every one has been long agreed as to the necessity of its being completely rebuilt. The architects are of the same opinion; and it will, it is said, be constructed in bronze, and be finished by Christmas next year."

ACCIDENTS.—One of the masons employed in the construction of the Bath theatre, was employed in laying stones at the end of a platform abutting on the stage-door entrance, when the support of it gave way and precipitated him into the street. He was not killed fortunately.——A plumber in Liverpool, while engaged in repairing some gutters on the roofs of the houses in Rutland-terrace, Berwick-street, placed his foot on some tallow which he had been using, and slipping fell off the roof of the house into the street below, and was killed.——An accident, illustrative of the perilously-slight manner in which cottages for the poor are built, occurred the other day at Manchester. A woman was coming down stairs in the cottage where she lived, in the Oldham-road, when she put her hand against the wall. This slight pressure pushed away the bricks, and the whole wall fell in! killing the poor woman by the fall of the rubbish. A verdict of manslaughter has been returned against the agent for the property; who, it appeared, had often, but in vain, been warned of the unsafe state of the property.——A farm-house in the west of Scotland has been split from top to bottom by lightning during a recent storm.

ANNULAR BRICK-KILNS.—The annular furnace (patented by Messrs. Hoffman & Licht) consists of a circular channel, of any section, which receives the articles to be fired; which articles are let in through doors in the outer wall, or by apertures formed in the top of the arch. Flues, of the same number as the doors, lead from the bed of the furnace to the smoke chamber, which surrounds the base of the chimney stalk. The communication can be shut off when required by means of cast-iron bell-shaped covers. A damper, which is moveable along the furnace, can be lowered in grooves let into the walls of the furnace, immediately after each flue, so as to separate the horizontal section of the furnace into distinct and equi-distant compartments. The fuel passes through apertures which are formed in the top of the arch; thence through channels, which are formed by the objects to be burned, to the bed of the furnace, in which a certain number of flues are cut to produce a free current to the fire in all parts. Among the advantages claimed are, that the atmospheric air necessary for the support of the fire absorbs the heat of the ready burned bricks and supplies the fire of the furnace with hot air, while on the other side the superfluous heat contributes to the gradual heating of the bricks to be burned, so that no heat is lost except that in the hot air necessary for keeping up the draught in the chimney-stalk. The charging and emptying of the furnace can be done at the same time and without interruption, and it is not necessary to wait for the bricks to cool. A saving is also effected in building the furnaces as compared with the old construction. The cost of these brick-kilns varies between 500*l*. and 2,000*l*. Such furnaces are at work in Germany.

EXTENT OF A HOTEL.—A hotel has just been completed at St. Louis, which is thus described:—"It is eight stories high; contains 515 rooms, 21 parlours, 27 acres of plastering, 7 acres of flooring, 32 miles of bell-wire, 9½ miles of base board, 12 miles of gas, steam, and water pipe, 1½ mile or 1,980 yards of hall, 810 windows, and 14,000 feet of painted imitation of cornice. The number of bricks used in the building is 8,000,000. In the basement there is a railway running the entire length, for the transportation of heavy articles; and above are two steam elevators for lifting fuel and baggage from the ground to the floors above."

DRINKING-FOUNTAIN MOVEMENT.—A memorial drinking-fountain has been erected, at a cost of about 200*l*., at Baildon, by Mr. Richard Paul Amphlett, of Wychbold Hall, Worcestershire, and Mrs. Amphlett; and has just been formally opened and presented to the village. The structure stands in the market-place, very near the market-cross, and consists of a column, about 20 feet in height, including a flight of four steps, by which it is approached. The material of the main shaft—6 feet in height, and 2 feet in diameter—is red granite from Aberdeen. This is surmounted by a canopy, on which the emblems of the four evangelists are sculptured, and by an ornamental cross in free-stone. The water flows from leaves on four sides of the base, into basins of Aberdeen granite. Round the flight of steps at the bottom of the column are 4 feet of asphalte, with a small stone pillar at each corner. The general character of the design is Old English. The architect employed was Mr. Crossland, of Halifax, an old pupil of Mr. G. G. Scott. The builders were Messrs. J. & W. Beanland, of Bradford and Halifax.

INTIMIDATION BY A STONEMASON.—At York, last week, the Lord Mayor was engaged in hearing a charge preferred against James Dunsmore, for having unlawfully used threats to George Fisher, for the purpose of forcing him to pay a fine of 2*l*. Mr. Mann appeared for the complainant, and Mr. Roberts, of Manchester, for the defendant. Some time ago the stonemasons of York struck for an advance of wages; and Fisher, who did not belong to the Masons' Union, was applied to by the union men to strike also. He declined to do so, but afterwards joined the society. He was then told that for refusing to give up working during the strike the union had inflicted a fine of 2*l*. This sum he did not pay; and he heard no more of the matter until the 26th of November last; when, having been for six weeks out of work, he had taken a job under Mr. Keswick, who has a contract for executing some of the work in connexion with Lendal Bridge. After breakfast on that day Dunsmore reminded Fisher of the fine of 2*l*., which still stood against him, and told him that unless that amount was paid the whole of the men would strike. On Saturday night a similar statement was made to Fisher; and on the following Wednesday Mr. Keswick discharged Fisher in consequence of a communication he received from his foreman, Henry Ward. The bench were of opinion that upon the evidence of Fisher the defendant had brought himself under the Act, and they awarded one month's imprisonment.

BRONZE DOORS FOR THE CAPITOL AT WASHINGTON.—An American paper has a description of the magnificent doors designed for the eastern front of the centre building of the Capitol at Washington:—"The door is composed entirely of bronze, back and front, and is said to be the only elaborate work of the kind in the world constructed in this manner. Its total weight is about 20,000lb. The leading subject of its embellishments is the history of Columbus. It has door valves, with four panels in each valve, and one semicircular panel over the transom. The first panel contains a scene representing Columbus before the Council of Salamanca; the second panel his leaving the Convent of La Rubida; the third panel his audience before Ferdinand and Isabella; the fourth panel his departure from Palos; semi-circular panel his first landing at San Salvador; the fifth panel his first encounter with Indians on the island of Hispaniola; the sixth panel his triumphant entry into Barcelona: the seventh panel represents him a prisoner in chains, about to be sent back to Spain; and the eighth panel contains a scene representing his death. There are sixteen small niches in the border or frame around the door, in which are sixteen statuettes, representing distinguished contemporaries of Columbus; and between the panels are heads representing historians who have written on his voyages from his own time down to the present day, ending with Irving and Prescott. Crowning the door is a bust of Columbus."

SIR JOHN SUTTON'S LONDON ESTATES.—With reference to our notice of the late Mr. Foxhall, we are asked to mention that he resigned the appointment to Sir John Sutton's London estates about a year and a half ago. Mr. Benjamin Ferrey was appointed his successor, and is now surveyor to the estates, which are very considerable.

THE OTTOMAN NATIONAL EXHIBITION.—The bad weather has at length proved too much for the contractors and workmen employed on the new building (says the *Levant Herald* of December 24th), and the latter have accordingly been knocked off since Sunday. The four porticoes, which are to form the entrances to the structure, were, however, covered in before this interruption; and a few days after the resumption of work will suffice to roof in the whole. This once done, the further progress with the shell of the building will be easy and rapid, though we shall still adhere to our conviction that neither the house nor its contents can possibly be ready for the proposed "opening" on the first day of Ramazan.

LEAD MINES.—The number of lead mines worked in Cornwall in 1861 was 44; in Devonshire, 11; in Cumberland, 79; in Northumberland and Durham, 39; in Westmoreland, 6; in Cheshire, 1; in Shropshire, 9; in Yorkshire, 30; in Somersetshire, 4; and in Staffordshire, 1; making a total for England of 224. As regards Wales, the county of Cardigan had 43 lead mines at work in 1861; Carmarthenshire, 3; Denbigshire, 14; Flintshire, 48; Montgomeryshire, 14; Merionethshire, 3; Pembrokeshire, 1; Radnorshire, 2; Carnarvonshire, 19; making a total for the principality of 147. The Isle of Man, at the same time, had 5 lead mines worked; Scotland, 7; and Ireland 7; making a total for the United Kingdom of 390, as compared with 380 in 1860, and 264 in 1859. The quantity of ore raised does not show a corresponding increase. The metallic lead produced from this aggregate of ore was 65,634 tons in 1861, against 63,317 tons in 1860, and 63,233 tons in 1859, the estimated value being 1,445,255*l.* in 1861, 1,412,660 in 1860, and 1,410,095 in 1859.

ORNAMENTAL LIVING FENCES.—Although by no means is this a new method of forming ornamental living fences, as it has been largely practised on the Continent for more than three centuries, I have seldom seen it used in Britain. It is the method of forming the sides of berceaux walks, and consists in planting young slender trees in a slanting direction—*i.e.*, every tree leaning the opposite way and in the same line, that they will cross each other and form a regular trellis with diamond-shaped openings. At the parts which come in contact, if a small piece of the bark is removed and the parts tied together and clayed over, as in common grafting, a union takes place, leaving each tree grafted into its neighbour, which in time makes one of the most beautiful and strong hedge fences imaginable. The following trees are best suited for the purpose;—Mountain ash, common ash, laburnum, most of the poplars, strong-growing willows, alders, birch, beech, chesnut, elm, hornbeam, &c. Such fences need at no time exceed four or five inches in thickness; and, when established a few years, will resist bullocks or any kind of cattle, and form excellent screens in gardens for separating one part from another, or for hiding out objects it is desirable shall not be seen. —L. O. S.—*Scottish Horticulturist.*

ARTISTS IN FRANCE.—At the recent distribution of medals at the Paris School of Fine Arts, Count Walewski made an address, at the close of which he said,—"Yes, gentlemen, the career of the arts is an everlasting struggle, a continued competition in which the high places are only attained by right of victory. Reflect, therefore; and, if you feel confidence in your own efforts, go forward. The time is propitious: barriers are being removed: prohibitions are disappearing: exhibitions succeed each other: from all points of France, and from all parts of Europe, a never-ceasing demand is made for your works; and it may without hesitation be proclaimed that artists are now the sole artisans of their own fortunes. Ought the protection of the State to be withdrawn from them for that reason on their leaving the school? Unquestionably not; only you will yourselves aid it to change its character that protection will no longer continue dividing itself and wasting its resources in often fruitless efforts: it will no longer have to seek necessities, but works: it will call them into existence: it will be the great and fruitful protection; that which creates the beautiful, because it knows how to honour and remunerate talent; and because, in order to excite art to become elevated, the reward must be placed aloft."

EMPLOYMENT FOR COTTON-WORKERS ABROAD.—At Brussels, in order to employ the poor who are suffering from the effects of the scarcity of cotton, a sum of 30,000 francs has been voted by the municipal council for the construction of some works of improvement in the city. They consist in levelling streets, prolonging others, and in improvements towards forming a new boulevard.

THE GLASGOW ART-UNION.—In this society this year the prizes are allotted as formerly; but, instead of the usual engraving, every member is to receive three photographs of as many pictures that form the chief prizes. These are "Morte d'Arthur," a work in sepia, by Mr. J. Noel Paton; "The White Cockade," by Mr. J. E. Millais; and "The Better Land," by Mr. Sant.

THE PROPOSED ROYAL ARCADE.—The proposed Royal Arcade is described as consisting of a covered public promenade and all necessary buildings, the object being to connect Bond-street with Regent-street. It will commence at a point in New Bond-street between Clifford-street and Conduit-street, near to Stevens's Hotel, and thence running in a direct line north-easterly, to terminate in Regent-street near Nos. 189 and 191 on the west side of that street, and near Old Burlington-mews. Its construction will necessitate the removal of a mass of old and ruinous houses for the erection of commodious shops and houses, besides improving the communication between the localities. The estimated cost of the proposed improvement is 290,000*l.*

THE DAM AT MARSHLAND.—On behalf of the district commissioners, Messrs. E. F. & E. Jackson, in a letter to the *Times*, called forth by previous remarks of a correspondent, enter into an explanation, in which they say,—The execution of the work was entrusted to Mr. Harding, who acted under orders from Mr. Page. As the work proceeded, the commissioners questioned its stability, and expressed to Mr. Page their dissatisfaction. Some correspondence ensued; and on the 16th of December Mr. Page signified to the commissioners that he could no longer act as their engineer, except for the security of the sluice and bank. The commissioners then requested him to state the time required for completion and at what cost. On the 21st of December, before the receipt of the reply, the work failed; and on the 23rd of December they discontinued his services. The commissioners did not consider it expedient to incur further expense in attempting to restore the work, the cost of which had already far exceeded their expectations.

COPPER MINES.—The number of copper mines worked in England and Wales in 1861 was 139, of which 97 were situate in Cornwall alone. In 1860 the number was 137, and in 1859, 147. The quantity of copper ore raised from these mines was 196,798 tons in 1861, as compared with 196,553 tons in 1860 and 208,031 in 1859. Besides these mines eight were worked, in 1861, in Ireland, as compared with ten in 1860 and 1859, the production of copper ore being 15,661 tons in 1861, 18,411 tons in 1860, and 14,258 tons in 1859. Various other districts produced 19,028 tons of copper ore and iron pyrites in 1861, 21,732 tons of copper ore in 1860, and 14,510 tons in 1859. The total production of copper ore for the United Kingdom was 231,487 tons in 1861, of the estimated value of 1,364,727*l.*; 236,696 tons in 1860, of the estimated value of 1,507,183*l.*; and 236,719 tons in 1859, of the estimated value of 1,506,835*l.* The yield of fine copper for the United Kingdom was 15,331 tons in 1861, of the estimated value of 1,572,480*l.*; 15,968 tons in 1860, of the estimated value of 1,706,261*l.*; and 15,770 tons in 1859, of the estimated value of 1,734,700*l.*

CLAMP FOR JOINERS.—A patent has been obtained by Mr. W. H. F. Wells, of Woolwich, for an improved clamp for the use of joiners and others engaged in working wood. It consists of a notched or plain bar of metal of any desired length, according to the purpose for which the clamp is to be applied. When one arm only is used, the end of the bar is turned up to form an abutment or pressing surface, against which one side of the material to be clamped is placed. The sliding arm is self-fixing by its peculiar form; and, when placed in the proper position upon the bar, forms the other abutment. An adjusting screw, fitted either in the head of the bar, or in the end of the sliding arm, or in both, completes the clamp. In place of turning one end of the bar up, a plain bar notched in opposite directions, and two sliding arms may be added. The sliding arms are formed with a hole or slot at one end, through which the bar can be passed. The arms can thus be moved along the bar to any required position.

DUBLIN WINTER GARDEN AND PALACE.—The directors have selected from the designs sent in by about twenty-four competitors, the design of Mr. Jones, of Dublin; but how far it will be carried out remains to be seen. The "quantities" are being taken out.

COUNTY SURVEYOR FOR STAFFORDSHIRE.—At the last meeting of the county magistrates, Mr. Robert Griffiths, of Bidgnorth, was appointed county surveyor, in the room of Mr. Trubshaw, deceased. There were sixty-seven candidates for the office, and among the number were many eligible men.

FALL OF A RAILWAY TUNNEL.—Twelve or fifteen yards of the end of a tunnel at Oakenshaw, on the Cleckheaton branch of the Lancashire and Yorkshire Railway, fell recently and completely blocked up the passage. A mail train from Mirfield, which should have reached Bradford at a quarter before six in the morning, ran into the midst of the rubbish. The engine was firmly embedded, but the passenger carriages were soon backed out. There was no loss of life nor other serious personal injury. Between seventy and eighty men were set to work to clear away the earth and rubbish, and it was expected that the line would be freed from obstruction on Tuesday night. A common road crossed the portion of the tunnel which fell in.

THE PROTESTANT CHURCH AT NAPLES. — The edifice will occupy a site in the Strada San Pasquale, atthe back of the Riviera di Chiaja, a quiet yet central spot. The stone was laid by an English lady whose maiden name was Locke, but who is now the Duchess of St. Arpino. The architects, Messrs. Smith & Son, of Hertford and London, were selected by a public meeting of subscribers in April last, and their plans were approved of by the British Government, who have made a grant of 1,500*l.* under the terms of the Consular Act. Mr. Smith is well known as the builder of several Protestant churches on the Continent, and very recently of one at Nice. The funds contributed up to the present time, inclusive of the Government grant of 1,500*l.*, amount to 4,150*l.*: of this nearly 2,000*l.* have been given in Naples, and 800*l.* by friends in England. The further sum of 1,500*l.* has, therefore, yet to be raised to complete the original design of the architects.

## TENDERS.

For the erection of the Royal Infirmary for Diseases of the Chest, City-road. Mr. J. L. André, architect. Quantities by Mr. C. Poland:—

| | | | |
|---|---|---|---|
| Axford & Co. | £2,630 | 0 | 0 |
| Mansfield & Son | 2,628 | 0 | 0 |
| Browne & Robinson | 2,556 | 0 | 0 |

For the erection of a slaughterhouse and stable for Mr. J. O. Moore, Rochester. Mr. J. H. Andrews, architect, Rochester:—

| | | | |
|---|---|---|---|
| Jennings | £434 | 0 | 0 |
| Sampson | 410 | 0 | 0 |
| Naylar & Son (accepted) | 400 | 0 | 0 |

## TO CORRESPONDENTS.

C. C. (we are always thankful for information. How else can the *Builder* focus the whole kingdom?).—A Mechanic's Son.—A. S.—A. W.—York (correspondents should send name and address).—W. B.—P. C.—M. P.—T. B.—R. G.—G. C.—F. L.—S. C.—E. W. (next week).—R. W. J. (let us see plan, and cost).—Beswethorick (a newspaper is, we believe, published in Jerusalem).—Alpha (no).—B. F.—W. S.—J. W. G.—W. B.—C. A. W.—Set Square (by private influence).—B. & Son.—R. G.

NOTE.—*The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.*

*Advertisements cannot be received for the current week's issue later than* **FIVE o'clock, p.m.,** *on Thursday.*

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